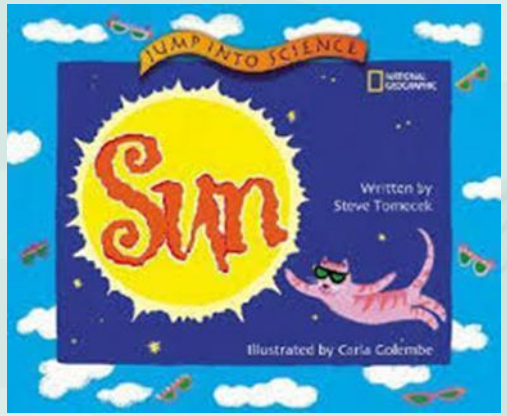
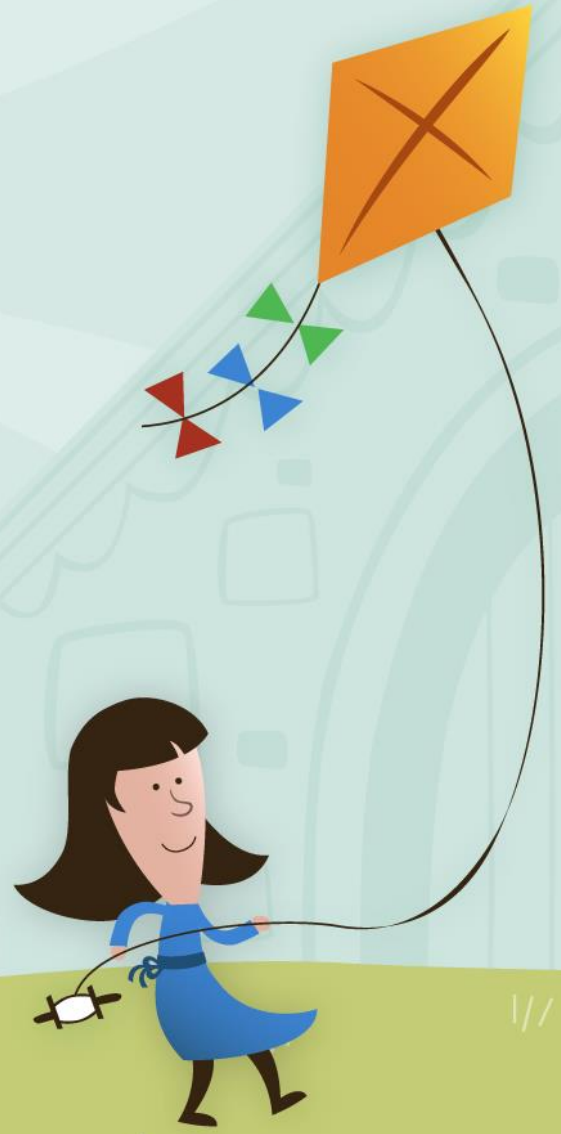
A Birthday is No Ordinary Day

PP STEM K-2





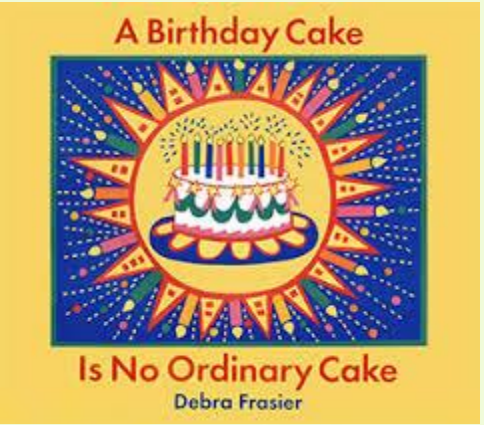
Lesson Objectives

- Science and Engineering Practices
  - Analyzing and Interpreting Data
  - Using Mathematics and Computational Thinking
- Disciplinary Core Ideas
  - ESS1.B Earth and the Solar System
- Crosscutting Concepts
  - Patterns
  - Cause and Effect

CCSS Connections

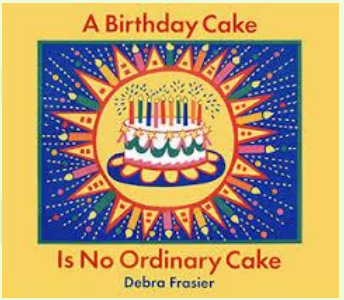
- Reading: Literature
  - Key Ideas and Details K-2.1
  - Integration of Knowledge and Ideas K-2.7
- Reading: Informational Text
  - Key Ideas and Details K-2.1
- Writing
  - Research to Build and Present Knowledge K-2.8
- Mathematics
  - Measurement and Data 1.MD.3, 1.MD. 4, 2.MD.7, and 2.MD.10

Engage *A Birthday Cake is No Ordinary Cake*



- What makes a birthday cake so special?
- Do you have any special birthday traditions?
- Do you eat cake, go out to dinner, or open presents?
- Turn and talk to a partner about your family's special traditions.
- Look at the picture of the Sun on the cover of our book. What do you think the Sun has to do with birthdays?

Engage *A Birthday Cake is No Ordinary Cake*



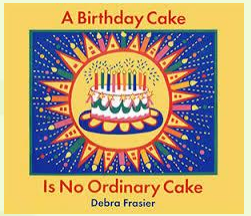
What Does the Sun have to do with birthdays?

- p. 7 “The Earth spins eastward toward the Sun to make morning, then spins away to make night. No spinning, no cake.”
- p. 8-9 “The Earth spins in a circle around the Sun from your birthday to your next birthday.”
- p. 12-13 “Collect the first sunrise after your birthday. You will need 364 more sunrises until your next birthday.”
- p. 26-27 “After collecting your 365th sunrise…”
- p. 30-31 “Light a candle for each time you’ve circled the Sun…And remember, we’re traveling in a circle. This recipe is a circle. It’s all coming around again.”

Engage *A Birthday Cake is No Ordinary Cake*

- So what does the Sun have to do with birthdays?
- Can you recall some of the ingredients in the birthday cake in the book?
- What messages do you think the author is trying to communicate through this book?

Explore: My Birthday Cake sheet



"At last, your cake is done. Let's light a candle for each time you've circled the Sun." (page 30)

- How many candles should your cake have?
- How many times have you circled the Sun?

Draw candles on top of the cake to represent each time you've circled the Sun in your lifetime.

Write

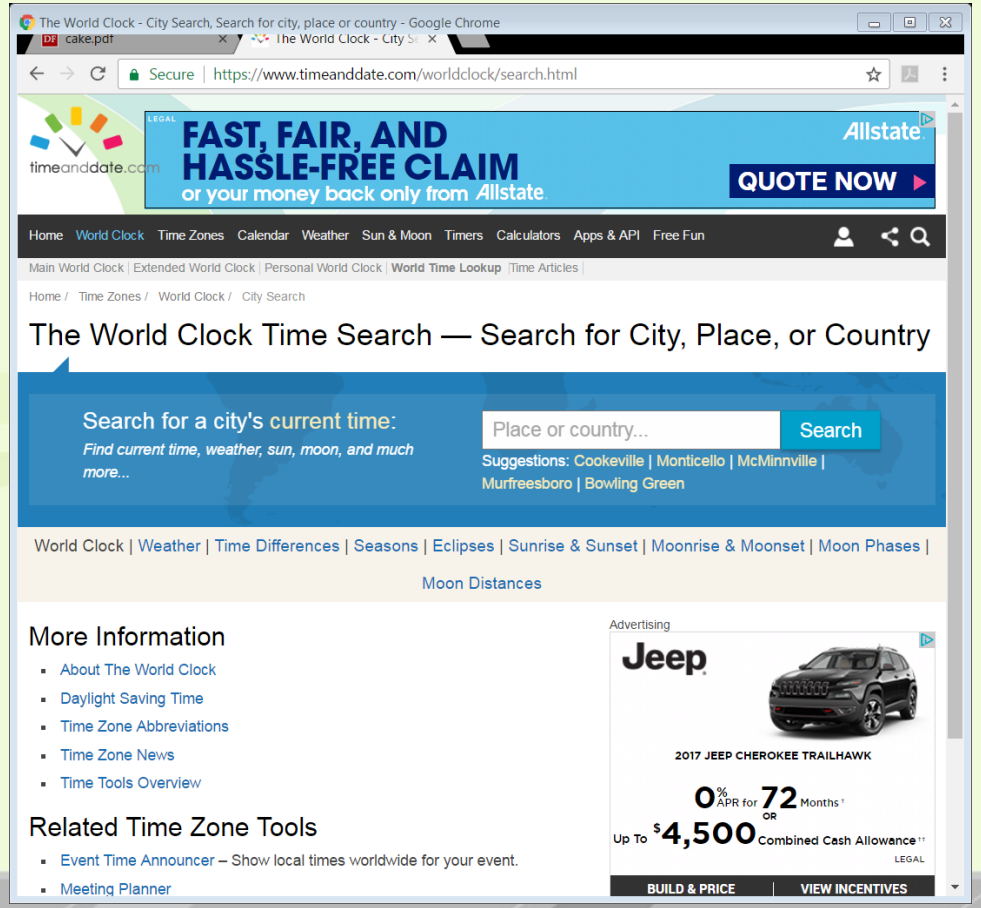
- your name beneath the words "Happy Birthday",
- your birth date on top of the cake, and
- the number of trips around the Sun on your **NEXT** birthday.

Explore: My Birthday Cake sheet

- What other information needs to be written on your birthday cake?
- Where do you think you could find that information?
- Do sunrises and sunsets occur at the same time everyday?
- What have you observed in your daily life about sunrises and sunsets? In other words, what evidence makes you think so?

Explore: My Birthday Cake sheet

- https://www.timeanddate.com/worldclock/search.html



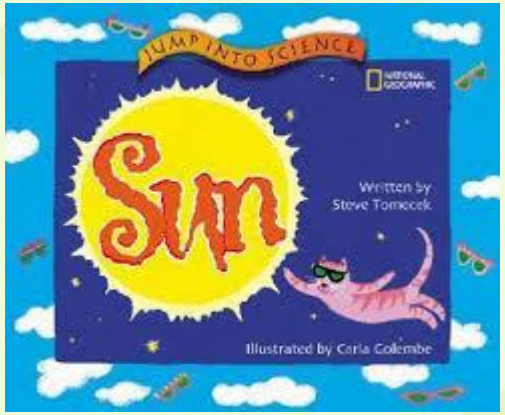
Explore: My Birthday Cake sheet

- Write the sunrise, sunset, and hours of daylight (in hours and minutes) on your cake.
  - Make sure you write all hours and minutes of daylight large enough for others to read at a distance.
- Cut out your cake for the next activity, Birthday Seasons.

Explain: Birthday Seasons

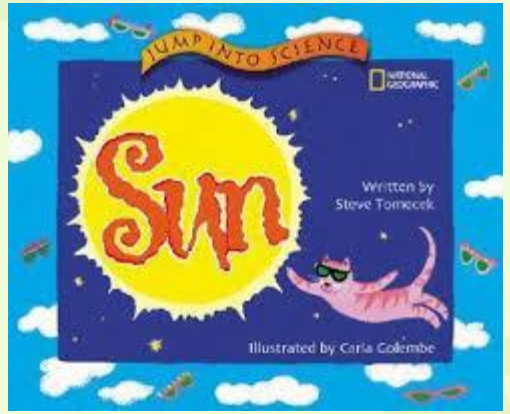
- During what season is your birthday?
- Using the posters around the room, line up in order by your birthday.
  - Hold your completed paper cake in front of you and form a large circle from January to December.
  - Is the length of day the same on everyone's birthday?
  - Why are they different?
  - Which student's birthday has the most hours and minutes of daylight?
  - In what season is that person's birthday?
  - Which student's birthday has the fewest hours and minutes of daylight?
  - In what season is that person's birthday?
  - How do the hours of daylight in the summer compare with the hours of daylight in the winter?
  - What patterns do you notice?

Explain: *Jump Into Science: Sun*



- Look at page 22 and examine the illustration carefully.
  - What time is it on the clock?
  - Is that morning or evening?
  - What is the girl doing?
  - What is it like outside her window?
  - What time of year is it?
  - Have you ever had to go to bed when it is still light outside in the summer?

Explain: *Jump Into Science: Sun*



- Look at page 23 and examine the illustration carefully.
  - What time is it on the clock?
  - Is that morning or evening?
  - What is the boy doing?
  - What is it like outside his window?
  - What time of year is it?
  - Have you noticed that it is dark in the morning when you leave for school on some winter days?

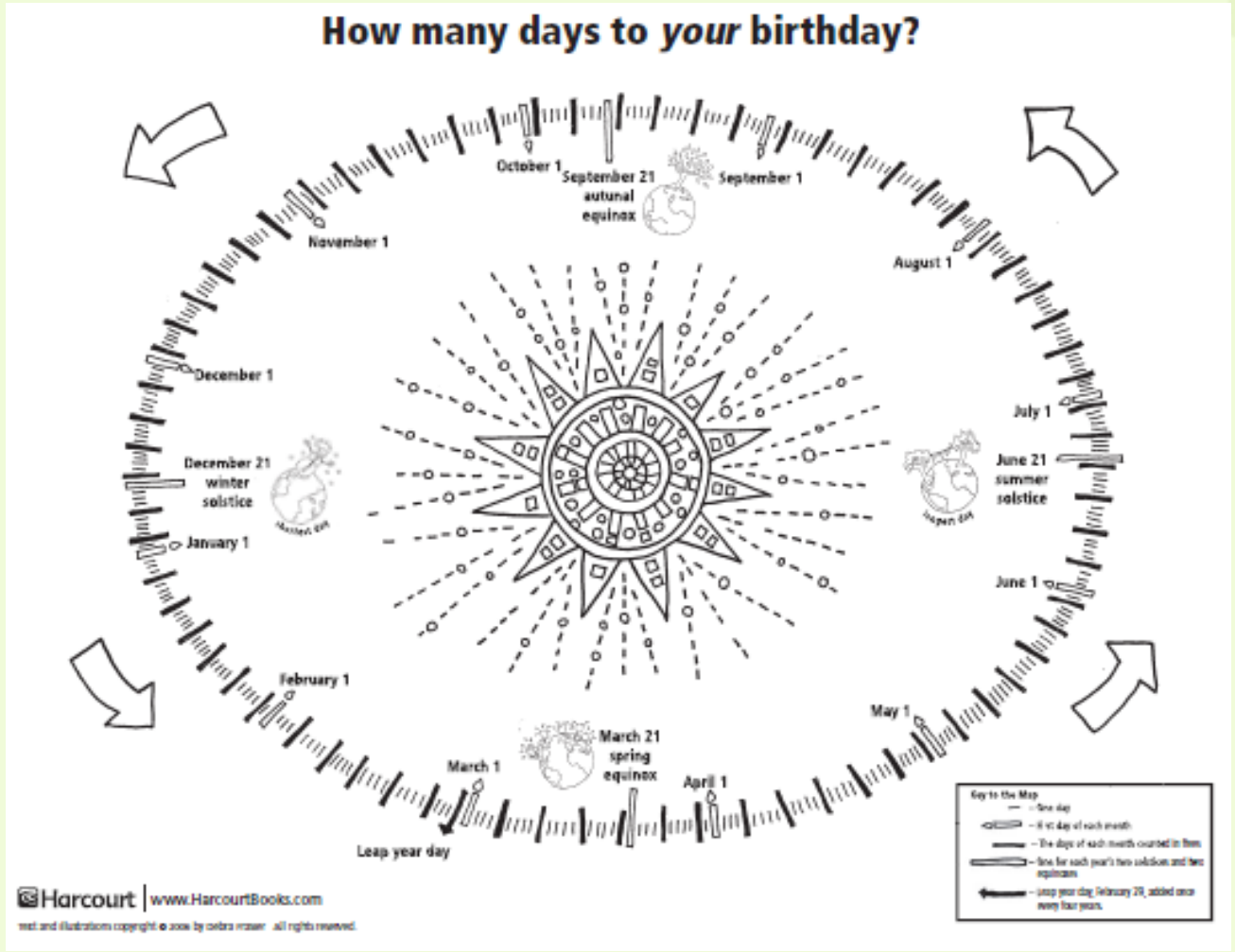
Explain: *Jump Into Science: Sun* and *A Birthday Cake is No Ordinary Cake*

- What causes day and night?
- What causes the hours of daylight, or the length of day, to be longer in the summer?
- What causes the hours of daylight, or the length of day, to be shorter in the winter?
- How long does it take Earth to travel, or orbit, all the way around the Sun?
- So how many orbits old are you?

Explain: Turn and Talk

- Turn and talk to a partner about how the season your birthday falls in and the observations you have made about the hours of daylight (length of day) on your birthday.

Elaborate: A Birthday Cake is No Ordinary Cake



Elaborate: Happy Birthday Game

Happy birthday to you,

____ trips around the Sun.

You’re another year older

And we hope you’ve had fun!

Evaluate: Design a Birthday Card

- Think of a friend or family member who has a birthday coming up.
- You are going to design a birthday card with science, technology, and math to teach the recipient what a birthday actually represents – another trip around the Sun!
  - Write the recipients name on the front and color in the Sun.
  - Complete the following information inside.
    1. The month and day of the recipient's birthday
    2. Sunrise time on the recipient's birthday
    3. Sunset time on the recipient's birthday
    4. The hours and minutes of daylight on the recipient's birthday
    5. A comparison with the hours of daylight on the student's own birthday (more/less/the same)
    6. A suggestion of what the recipient could do outside on his or her birthday (considering the season and the length of day)
    7. A response to "A birthday is no ordinary day. A birthday is another trip around the_____!"
    8. A labeled sketch showing that a birthday represents a trip around the Sun.
  - Sign and decorate the card.

A Birthday is No Ordinary Day

- What did you learn today?
- What was your favorite part of the lesson?
- See your STEM at Home sheet for another experiment you can do at home.

Source

- Picture Perfect STEM K-2. (2017). National Science Teachers Association.