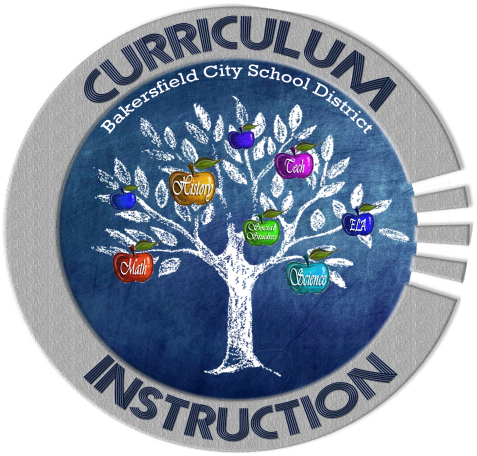
# 2021-2022 SCIENCE UNITS

## GRADE 5

BAKERSFIELD CITY SCHOOL DISTRICT

**ACHIEVING EXCELLENCE FOR ALL STUDENTS**

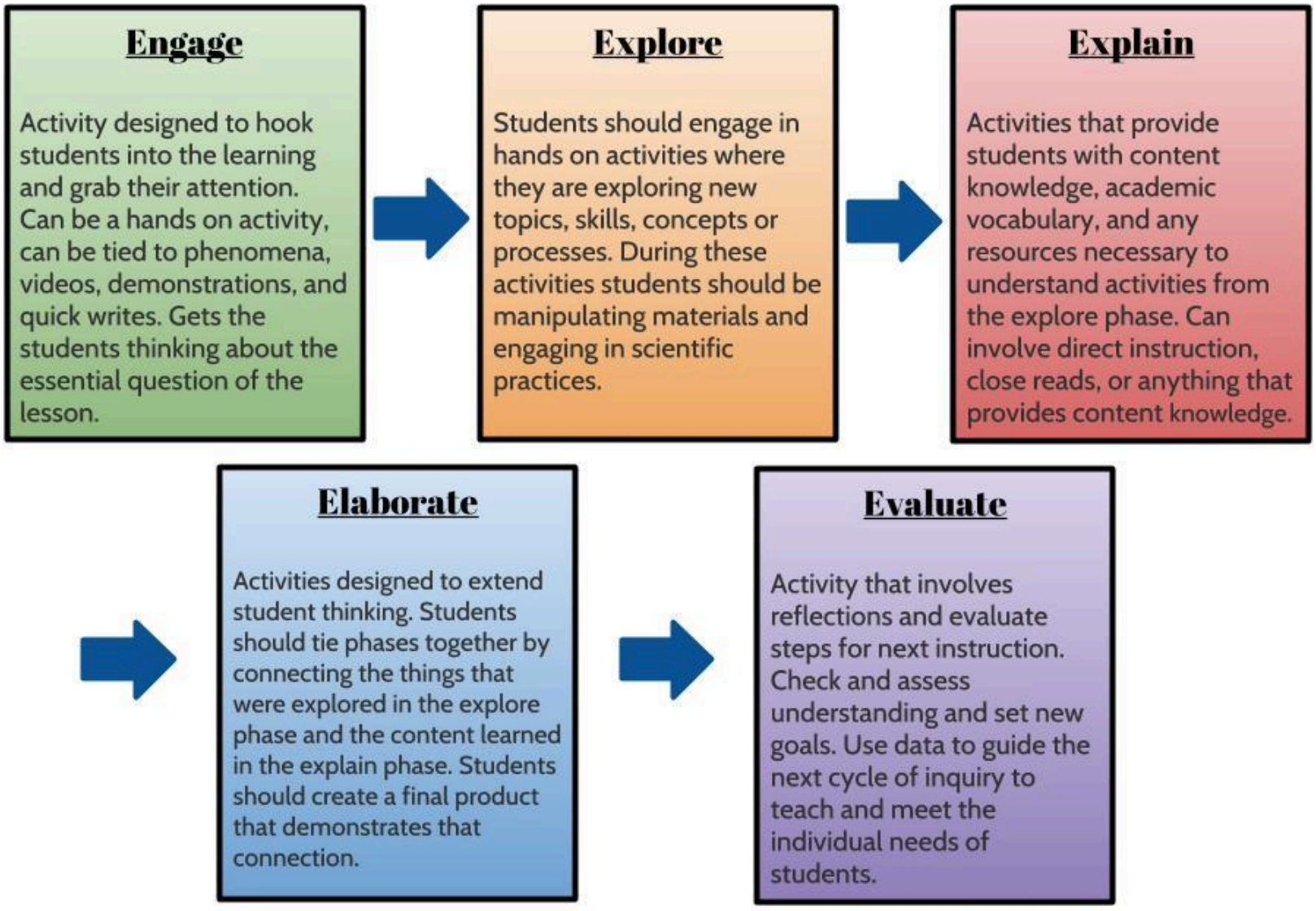
*Through Equity and Innovation*




# 5th Grade Unit 4

## Space Systems: Stars and the Solar System

# Writing a 5E Lesson






Resources: *National Science Teaching Association, nsta.org*

# Unit at a Glance

## Link to Unit Standards

Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth. 5-ESS1-1

**Clarification Statement:** none

**Assessment Boundary:** Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, stage).

Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. 5-ESS1-2

**Clarification Statement:** Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.

**Assessment Boundary:** Assessment does not include causes of seasons.

Support an argument that the gravitational force exerted by Earth on objects is directed down. 5-PS2-1

**Clarification Statement:** “Down” is a local description of the direction that points toward the center of the spherical Earth.

**Assessment Boundary:** Assessment does not include mathematical representation of gravitational force.

# *5-ESS1-1: Distance from the Earth*

## *Standard Clarification*

***Standard focuses and students understanding that:***

- The differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth.
- Natural objects exist from the very small to the immensely large.
- Stars range greatly in their distance from Earth.
- The sun is a star that appears larger and brighter than other stars because it is closer.

# 5-ESS1-1: Distance from the Earth

| Academic Vocabulary | Phenomena* | 5E Lessons | Manipulatives | Essential Questions |
|---|---|---|---|---|
| • Apparent Magnitude<br>• Absolute Magnitude<br>• Star<br>• Sun | • Sun<br>• Stars<br>• Picture 1<br>• Picture 2<br>• Picture 3<br>• Picture 4 | Lesson 1- Distance to Earth*<br><br>*(*Modifications for virtual learning are embedded in the 5E lesson)* | • 15- Flashlights- (these will be reused later in the unit) | • *Does distance from Earth affect the brightness of a star?* |
| **Functions**<br>• _____ is brighter because _____. | ***Mystery Science***<br><br>*Spaceship Earth - Lesson 8*<br><br>*8 Mysteries - Use as an alternative unit or individual mysteries can be used as a supplement within the district unit.* | **Link to Standard**<br><br>*5-ESS1-1*<br><br>**Paired Texts**<br><br>Appearance of Stars | ***TCM Science Readers***<br><br>Guided by Stars*<br><br>**If you attended Science Saturday, these titles are included in your box. A digital PDF reader is available for this topic* | |

| BrainPOP | Zingy Learning | | | Achieve 3000 |
|---|---|---|---|---|
| *Login with Clever*<br>***Suggested lesson(s):***<br><br>***The Sun*** | *Sign-up/Login*<br>***Suggested lesson(s):***<br><br>***5th grade, Unit 11, lesson 1: Stars*** | | | *The Show of a Lifetime*<br><br>*Starry, Starry Night*<br><br>*Where are the Sun's Spots* |

**Phenomena supports Academic Language Development through picture prompts*

# 5-ESS1-2: Patterns of Stars and Seasons

## Standard Clarification

***Standard focuses and students understanding that:***

- Earth orbits around the sun, the moon orbits around Earth, and Earth rotates on an axis
- There are changes in the length and direction of shadows depending on the positions of the sun, moon, and stars at different times of the day, month, and year.
- Representing data in graphical displays to demonstrate patterns of changes in shadows
- Stars are visible only during particular months

# 5-ESS1-2: Patterns of Stars and Seasons

## Academic Vocabulary

- Orbit
- Shadow
- Sun
- Moon
- Stars

## Functions

- Compare and contrast

## Phenomena*

Photos:

- Image 1
- Image 2
- Image 3
- Image 4

### Mystery Science

*Spaceship Earth*
*Lesson 2 - Who created the first clock?*

*8 Mysteries - Use as an alternative unit or individual mysteries can be used as a supplement within the district unit.*

## 5E Lessons

*Lesson 2- Casting Shadows*

*(*Modifications for virtual learning are embedded in the 5E lesson)*

## Link to Standard

*5-ESS1-2*

## Paired Texts

*What Causes Seasons*

## Manipulatives

Engage phase

- Flashlights (15)- used in the first lesson.

Explain phase

- Flashlights (15)- from above
- Toy figurine (15)
- Ruler* (15)
- Tape*
- Gluesticks*
- Protractors (15) (duplicate in cardstock from link)

Elaborate phase:

- Measuring tape (15)
- Chalk*

**This item will not be included in the science kit*

## Essential Questions

- How does the position of the sun affect the length of shadows throughout the day?

## Achieve 3000

| | | | | |
|---|---|---|---|---|
| ***BrainPOP***<br>*Login with Clever*<br><br>***Suggested lesson(s):***<br>Seasons<br>Constellations | ***Zingy Learning***<br>*Sign-up/Login*<br><br>***Suggested lesson(s):***<br>5th grade, Unit 12, Lessons 1-5: Stars | | | *Changing Seasons*<br><br>*The Moon puts on a Show* |

**Phenomena supports Academic Language Development through picture prompts*

# 5-PS2-1: Earth's Pull of Gravity

| Standard Clarification |
| --- |
| ***Standard focuses and students understanding that:***<br>● *Gravitational force pulls objects down.* |

# 5-PS2-1: Earth's Pull of Gravity

## Academic Vocabulary

- Gravity
- Gravitational force
- Air resistance
- Mass
- Weight

## Functions

- Cause and effect
- Gravity causes _____.
- Heavier objects fall _____than lighter objects.

## Phenomena*

Photos:

- Image 1
- Image 2
- Image 3

Video:

- Video 1

### Mystery Science

Spaceship Earth
*Lesson 7 - Gravity*

*8 Mysteries - Use as an alternative unit or individual mysteries can be used as a supplement within the district unit.*

## 5E Lessons

Lesson 3- Earth's Pull of Gravity

*(*Modifications for virtual learning are embedded in the 5E lesson)*

## Link to Standard

5-PS2-1

## Paired Texts

- *Forces of Attraction*
- What is Gravity?
- Five things that happen to your body in space
- What causes the tides in the ocean?

## Manipulatives

For Engage activity

- Feather (15)
- Ball* (use a school ball or tennis ball)

For Explain activity

- Ping pong ball (or other small object)*
- Marble (or other small object)*
- Paper clip*
- eraser*
- pencil*
- paper*

*This item will not be included in the science kit

## TCM Science Readers

Gravity

**If you attended Science Saturday, these titles are included in your box. A digital PDF of this title is available at the link above.*

## Essential Questions

- Why do objects fall to the ground?
- Do all objects fall at the same rate?

## Achieve 3000

*Oil Spill Bad for Bay*

| | | | | |
|---|---|---|---|---|
| ***BrainPOP***<br>*Login with Clever*<br><br>***Suggested lesson(s):***<br>Gravity<br>Galileo Galilei | ***Zingy Learning***<br>*Sign-up/Login*<br><br>***Suggested lesson(s):***<br>5th grade, Unit 13, Lessons 1-2: Gravity | | | |

**Phenomena supports Academic Language Development through picture prompts*

# Additional Unit Resources

| | |
|---|---|
| Reading/ Navigating the Standards | Standard Codes |
| Writing a 5E Lesson | Unit and Lesson Planning |

# Online Resources

| Resource | Description |
|---|---|
| Teach Engineering | Great hands on activities/ science and engineering lessons |
| Try Engineering | Engineering lesson plans and resources |
| Phet | Wonderful demonstrations, visual models and simulations |
| Better Lesson | Additional lessons and lesson planning strategies |