Science

- Grades K-3
    - CC.1: Patterns: Patterns of change can be used to make predictions.
        - Predicting eclipse thousands of years from now
    - CC.2: Cause and Effect: Cause and effect relationships are routinely identified.
        - Moon in front of sun, it gets darker and cooler
    - CC.3: Scale, Proportion, and Quantity: Observable phenomena exist from very short to very long time periods.
        - Scale of sun and moon and distance to sun and moon allow for eclipses
    - CC.4: Systems and System Models: A system can be described in terms of its components and their interactions.
        - General discussion about how orbit of moon and Earth cause eclipses

- Grade 4
    - PS4.B: Electromagnetic Radiation: An object can be seen when light reflected from its surface enters the eyes.
        - Reflection of sunlight of moon causing phases and effect on eclipse
    - LS1.D: Information Processing: Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions.
        - Darkening of sky during eclipse
            - Can see stars and planets during daytime
        - Changes in sound during eclipse
            - Animal sounds
        - Temperature change during eclipse
    - PS3.B: Conservation of Energy and Energy Transfer: Light also transfers energy from place to place
        - Changes in solar power generation during eclipse
- Grade 5
    - ESS1.B: Earth and the Solar System: The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year.
        - Phases of moon and the shadow of the moon on earth during eclipse
            - Speed of eclipse
    - PS2.B: Types of Interactions: The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.
        - Orbits of Earth and moon lead to eclipses

- Talk about how stars are in same position all the time, but only see them during the daytime when there is an eclipse
    - CC.3: Scale, Proportion, and Quantity:  Natural objects exist from the very small to the immensely large.
        - Scale of sun and moon and distance to sun and moon allow for eclipses
            - Can do simple calc to show sun and moon are same size in our sky

## Math

- K-3
    - PS.4:  Model with mathematics.  Mathematically proficient students apply the mathematics they know to solve problems arising in everyday life, society, and the workplace using a variety of appropriate strategies. They create and use a variety of representations to solve problems and to organize and communicate mathematical ideas. Mathematically proficient students apply what they know and are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts, and formulas. They analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.
        - Talk about how mathematical models of the solar system naturally predict eclipses and allow us to predict the time and place of an eclipse 100s of years in the future.  For this level, use comparison like the earth is a basketball and the moon is a ping pong ball
    - 3.G.1  Define, identify, and classify four-sided shapes such as rhombuses, rectangles, and squares  as quadrilaterals. Identify and draw examples and non-examples of quadrilaterals.
        - ID orbits as circles (or ellipses) and talk about how that gives us an eclipse
- Grade 4
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  - ○ 4.M.2 Within given measurement systems, convert larger units to smaller units, including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec., and use these conversions to solve real-world problems.
    - Talk about Sun-Earth distance and Earth-Moon distance and how it is related to eclipses
- Grade 5
  - ○ PS.4: Model with mathematics. Mathematically proficient students apply the mathematics they know to solve problems arising in everyday life, society, and the workplace using a variety of appropriate strategies. They create and use a variety of representations to solve problems and to organize and communicate mathematical ideas. Mathematically proficient students apply what they know and are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts, and formulas. They analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.
    - Talk about how mathematical models of the solar system naturally predict eclipses and allow us to predict the time and place of an eclipse 100s of years in the future. For this level, use comparison like the earth is a basketball and the moon is a ping pong ball, but actually go into the math a little
  - ○ 5.M.1 Convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multi-step, real-world problems.
    - Talk about Sun-Earth distance and Earth-Moon distance and how it is related to eclipses

## Literacy

- K-3
  - ○ 3.RF.5 Orally read grade-level appropriate or higher texts smoothly and accurately with expression that connotes comprehension.

- ■ Books with eclipse as a plot point
  - ○ 3.RC.2  Recount folktales, fables, and tall tales from diverse cultures; identify the themes in these  works.
    - ■ Many cultures incorporate eclipses into myths and legends
- ● Grade 4
  - ○ 4.RF.3  Orally read grade-level appropriate or higher texts smoothly and accurately with expression  that connotes comprehension.
    - ■ Books with eclipse as a plot point
  - ○ 4.RC.2  Paraphrase or summarize the main events in a story, myth, legend, or novel; identify the  theme and provide evidence for the interpretation.
    - ■ Many cultures incorporate eclipses into myths and legends
- ● Grade 5
  - ○ 5.RF.2  Orally read grade-level appropriate or higher texts smoothly and accurately, with expression  that connotes comprehension.
    - ■ Books with eclipse as a plot point
  - ○ 5.RC.5  Compare and contrast stories in the same genre on their approaches to similar themes and  topics.
    - ■ Read multiple books, maybe from different cultures, and discuss how eclipse are presented (good event, bad event, etc.)