**Connecting to the Next Generation Science Standards (NGSS Lead States 2013):**

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| **Science and Engineering Practices** | **Connections to Classroom Activity** |
| Constructing Explanations and Designing Solutions | * Students designed a simple quadrant out of everyday materials to measure the angular height of distant objects.
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| **Disciplinary Core Ideas** |  |
| ETS1.C: Developing Possible Solutions• Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and constraints.ESS1.B Earth and Solar System• The orbits of Earth around the Sun and of the Moon around Earth, together with the rotation of Earth, can cause observable patterns. | * Students used a criteria rubric to quantify test results for the simple quadrants when used to measure the angular height of a distant object.
* Students used simple quadrants to infer how the Moon moves between rise and set.
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| **Crosscutting Concepts** |  |
| Structure and FunctionPatterns | * Students reverse engineered manufactured quadrants to determine how they work prior to designing simple quadrants.
* Students used simple quadrants to infer the patterns of movement of the Moon between rise and set.
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**Performance Expectations**

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

**Connecting to the *Common Core State Standards* (NGAC and CCSSO 2010):**

**Mathematics:**

Fourth Grade: Geometric measurement: understand concepts of angle and measure angles.

* Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.
* Measure angles in whole-number degrees using a protractor.