# Scientific Reasoning (SR) at Longwood University

# Overview

## How is this core competency defined at Longwood?

Students will be able to use scientific reasoning to address a variety of questions in context.

## How are Longwood students able to develop the knowledge and/or abilities expected of this competency?

Civitae Core SR designated courses provide experiences and activities to develop knowledge and abilities.

### At the completion of the Pillar course, students will be able to:

**Element 1:** Use scientific theories, scientific models, and empirical evidence to describe and make predictions about natural phenomena.

**Element 2:** Use the scientific method, which includes making objective observations, asking scientific questions, formulating hypotheses, identifying relevant variables, planning and carrying out investigations, evaluating data, and drawing evidence-based conclusions.

**Element 3:** Evaluate the quality and validity of scientific information on the basis of its source and methods used to generate it.
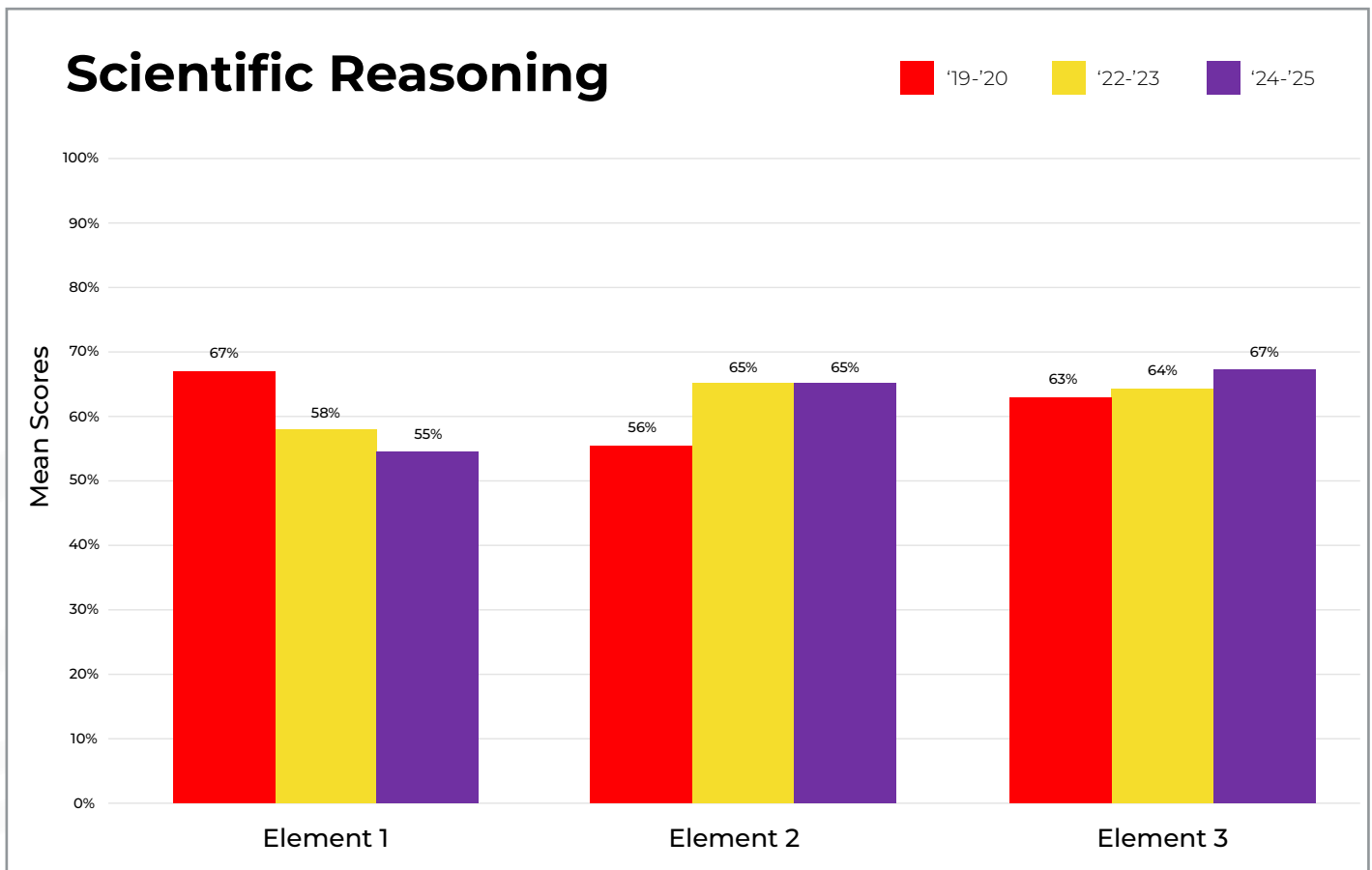
# Goals & Methods

## How do we know whether and how well students have achieved the competency?

Scientific Reasoning is specifically addressed in the outcomes of all relavent Pillar courses. All students are required to take a SR course of their choice to satisfy Foundation requirements. The direct measure is carried out by utilizing a valid, reliable, and widely available selected response assessment instrument: the Madison Assessment SR Test. A segment of the student population targeted by the proposed assessment are those students who are enrolled in Fall semester SR Pillar courses.

### Expected Level of Success:

70% target score for each of the three student learning outcomes.

## Competency Assessment Results

### Scientific Reasoning

Legend: ■ '19-'20  ■ '22-'23  ■ '24-'25

Mean Scores (y-axis, 0% to 100%)

Element 1: 67%, 58%, 55%
Element 2: 56%, 65%, 65%
Element 3: 63%, 64%, 67%

# Key Findings

The Madison Test was most recently given in 2022-23 and in 2024-25 Longwood University students did not meet the 75% target mean score in either year, with the lowest scores being for Element 1: Using scientific theories, scientific models and empirical evidence to descrbie and make predictions about natural phenomena.

# Actions & Next Steps

Action Items and Next Steps to be determined by faculty in Professional Development workshops on August 10, 2025.