

## Reasoning in the Natural Sciences 2019-2020

Courses or course sequences addressing Reasoning in the Natural Sciences (RNS) must meet a majority of the student learning outcomes (SLOs). During the Fall 2019 semester,<sup>1</sup> Virginia Tech offered 37 Pathways courses that included the Core Concept of RNS.

	Overall
Pathways Sections Offering RNS	348
Pathways Sections Reporting RNS Data <sup>2</sup>	337 (97%)
Pathways Sections Included in Analyses <sup>3</sup>	335 (96%)
Enrollment in Sections Offering RNS*	17,706
Enrollment in Sections Included in Analyses*	16,762 (95%)

\* Values include students who may be enrolled and/or assessed in multiple Pathways courses.

*Table 1: Competency Levels per SLO for RNS*

	Sections Included in Analyses*	Students Included in Analyses	Percentage of Students		
			Below Competent	Competent	Above Competent
SLO 1: Explain the foundational knowledge of a particular scientific discipline.	260	8,433	24% (n=1,982)	32% (n=2,714)	44% (n=3,737)
SLO 2: Apply principles and techniques of scientific inquiry.	246	7,301	26% (n=1,866)	34% (n=2,450)	41% (n=2,985)
SLO 3: Evaluate the credibility and the use/misuse of scientific information.	164	1,745	18% (n=311)	41% (n=718)	41% (n=716)
SLO 4: Analyze the reciprocal impact of science and society.	181	7,233	7% (n=541)	12% (n=888)	80% (n=5,804)

\* Includes sections required to report data for a specific outcome and additional sections reporting data.

<sup>1</sup> Pathways assessment data collection was suspended for Spring 2020 due to the COVID-19 pandemic. Consequently, only data from the Fall 2019 semester are included in this report.

<sup>2</sup> Four sections (1%) were missing data for one or more required SLOs; 333 sections (99%) provided complete data.

<sup>3</sup> Data from 260 sections (77%) were fully included; 75 sections (22%) were partially included; 2 sections (<1%) were excluded.

## Reasoning in the Natural Sciences 2019-2020

SLO 1: Explain the foundational knowledge of a particular scientific discipline.

	Sections Required to Report Data for SLO 1	Additional RNS Sections Reporting Data for SLO 1	Total Sections Included in Analyses of SLO 1
Pathways Sections Offering SLO 1	346	N/A	346
Pathways Sections Reporting Data	336 (97%)	N/A	336 (97%)
Pathways Sections Included in Analyses	260* (75%)	N/A	260 (75%)
Enrollment in Sections Offering RNS 1**	17,520	N/A	17,520
Students Included in Analyses**	8,433 (48%)	N/A	8,433 (48%)

\* Data from 76 sections were excluded.

\*\* Values include students who may be enrolled and/or assessed in multiple Pathways courses.

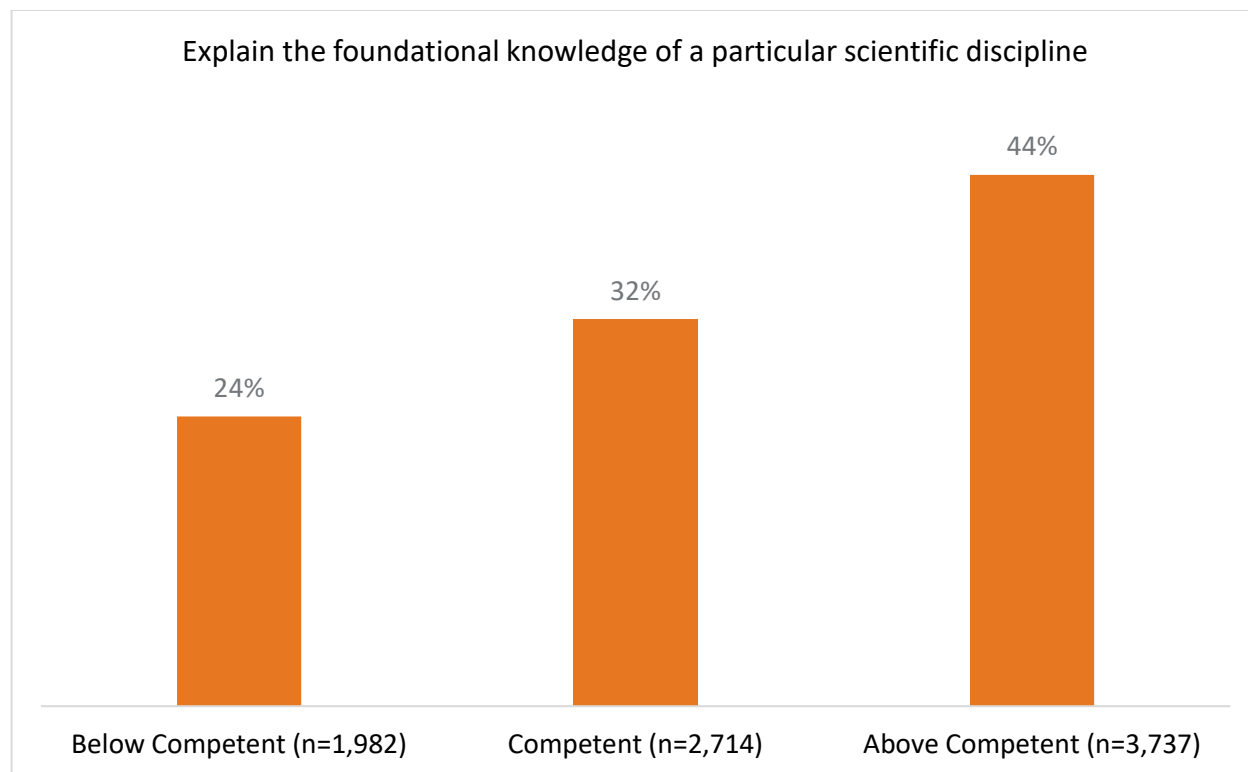


Figure 1. (n=8,433)

## Reasoning in the Natural Sciences 2019-2020

SLO 2: Apply principles and techniques of scientific inquiry.

	Sections Required to Report Data for SLO 2	Additional RNS Sections Reporting Data for SLO 2	Total Sections Included in Analyses of SLO 2
Pathways Sections Offering SLO 2	335	N/A	335
Pathways Sections Reporting Data	323 (96%)	N/A	323 (96%)
Pathways Sections Included in Analyses	246* (73%)	N/A	246 (73%)
Enrollment in Sections Offering RNS 2**	16,688	N/A	16,688
Students Included in Analyses**	7,301 (44%)	N/A	7,301 (44%)

\* Data from 77 sections were excluded.

\*\* Values include students who may be enrolled and/or assessed in multiple Pathways courses.

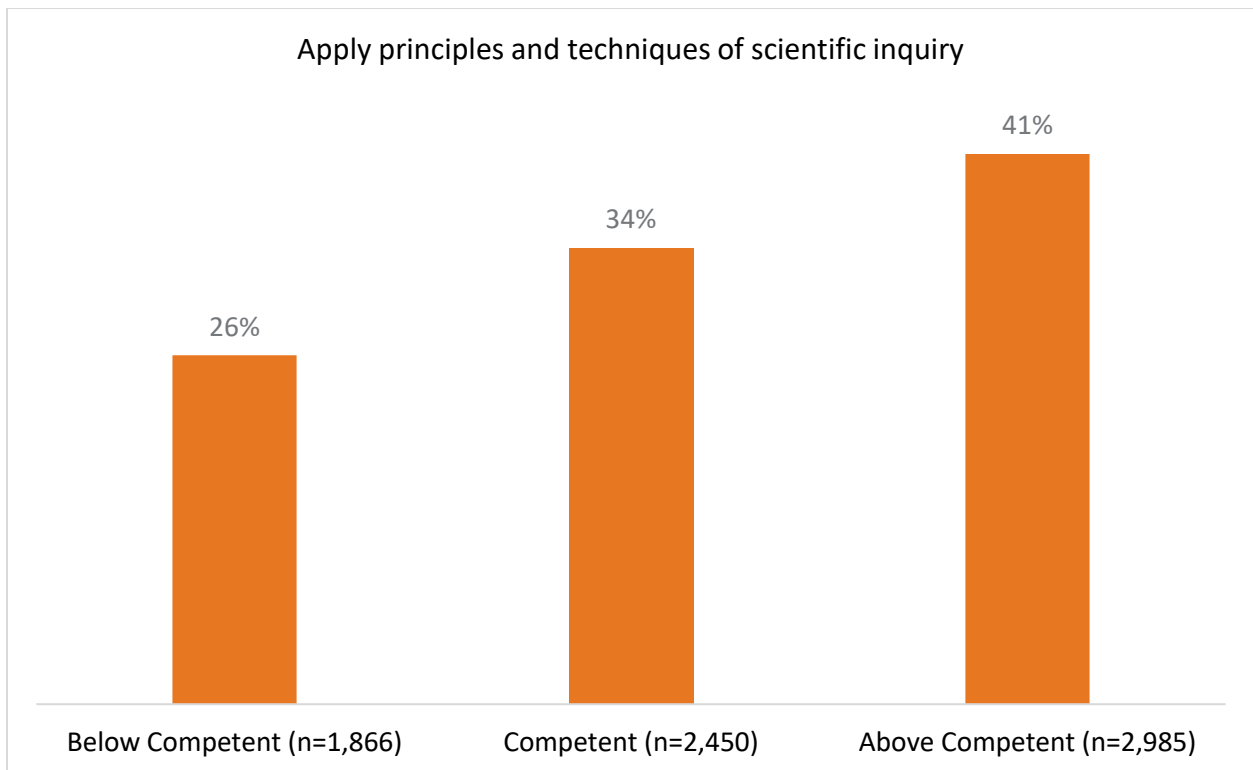


Figure 2. (n=7,301)

## Reasoning in the Natural Sciences 2019-2020

SLO 3: Evaluate the credibility and the use/misuse of scientific information.

	Sections Required to Report Data for SLO 3	Additional RNS Sections Reporting Data for SLO 3	Total Sections Included in Analyses of SLO 3
Pathways Sections Offering SLO 3	176	2	178
Pathways Sections Reporting Data	164 (93%)	2 (100%)	166 (93%)
Pathways Sections Included in Analyses	162* (92%)	2 (100%)	164 (92%)
Enrollment in Sections Offering RNS 3**	7,685	303	7,988
Students Included in Analyses**	1,695 (22%)	50 (17%)	1,745 (22%)

\* Data from 2 sections were excluded.

\*\* Values include students who may be enrolled and/or assessed in multiple Pathways courses.

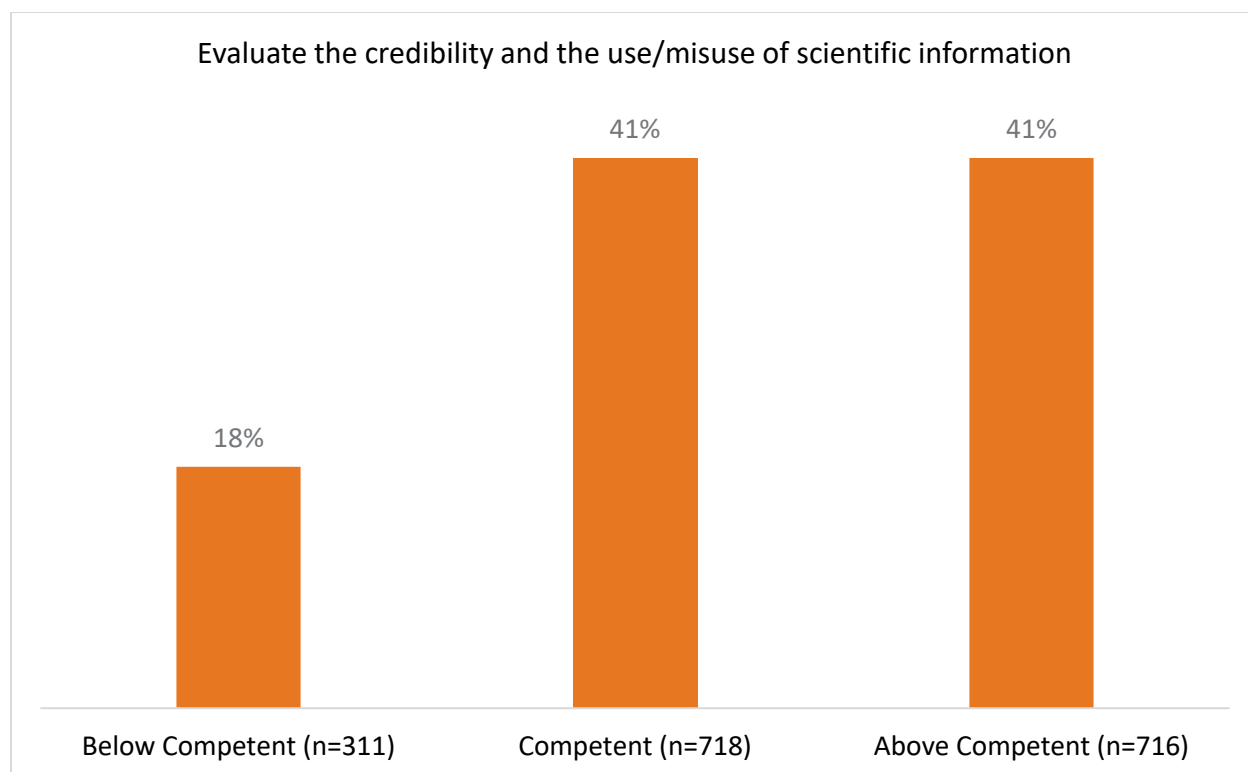


Figure 3. (n=1,745)

## Reasoning in the Natural Sciences 2019-2020

SLO 4: Analyze the reciprocal impact of science and society.

	Sections Required to Report Data for SLO 4	Additional RNS Sections Reporting Data for SLO 4	Total Sections Included in Analyses of SLO 4
Pathways Sections Offering SLO 4	188	1	189
Pathways Sections Reporting Data	181 (96%)	1 (100%)	182 (96%)
Pathways Sections Included in Analyses	180* (96%)	1 (100%)	181 (96%)
Enrollment in Sections Offering RNS 4**	11,317	15	11,332
Students Included in Analyses**	7,218 (64%)	15 (100%)	7,233 (64%)

\* Data from 1 section were excluded.

\*\* Values include students who may be enrolled and/or assessed in multiple Pathways courses.

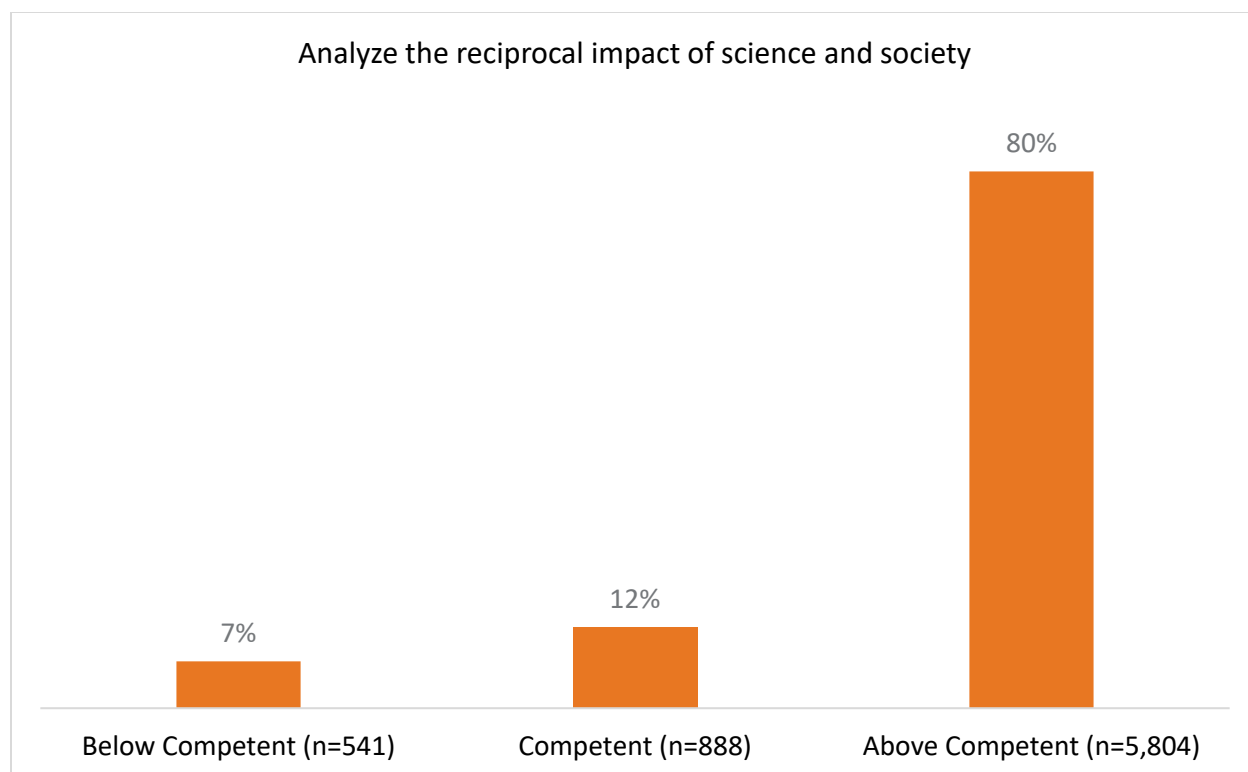


Figure 4. (n=7,233)