The background features a dark grey, chalkboard-like texture with various white sketches. On the left, there is a detailed drawing of a microscope. Above it, a globe of the Earth is sketched. Below the microscope, there are sketches of books and a stack of papers. On the right side, there are sketches of a percentage sign, an exclamation mark, and a right-pointing arrow. The overall theme is academic and scientific.

One artifact, many outcomes: Aligning assessment in a Capstone course

Samantha Gizerian
August 16, 2022

Neuroscience 490 [CAPS] Senior Project

- 25-35 Neuroscience seniors/year, spring semester
- Focus on development of Scientific Communication and Professional skills
- KidsJudge Neuroscience fair
- Develop and Present a research project



Research Project Assignment Scaffold

Research Question

- Choose a topic
- Generate a hypothesis
- Work with faculty to narrow the focus

Abstract

- Discuss Abstract structure and purpose in class
- Write draft
- Peer review of abstract draft

Poster

- Write outline for poster content based on abstract
- Create draft for Peer review
- Present to family, friends, faculty

Oral Presentation

- Draft slides for peer review
- 10-minute presentation evaluated by faculty with rubric

The [CAPS] Assessment Artifact

- The Oral Presentation is the culmination of the scaffolded skills practiced throughout the semester:
 - Refining a research question
 - Leveling communications appropriately for the audience
 - Organizing data to support an argument
 - Linking information from the most basic to the most applied
 - Thinking critically about systems
- The presentation score as evaluated by rubric captures the level of students' knowledge and skills
 - The Neuroscience Program archives the rubrics/scores, presentation slides, and final posters for each senior

Date _____

Student's Name _____

Evaluator's Name _____

NEUROSCI 490 RUBRIC SPRING 2021

ELEMENT	CRITERIA (check ✓ an appropriate box in each row)	For each of the criteria the student's work was:					Comments
		Excellent	Very Good	Good	Partial	Absent	
1. Student Position The perspective, thesis, hypothesis, idea, or claim that inspired the project.	Clearly articulates or proposes the position (perspective, thesis, hypothesis, idea, or claim) that inspired project						
	Locates their position within larger disciplinary context (i.e. the big picture)						
	Makes connections from the molecular to the systems level or higher						
	Analyzes the complexity of the position, synthesizes other points of view, and evaluates limitations of project						
2. Novel Contribution/ Innovative Thinking Novelty or uniqueness of idea, claim, question, form, etc.	Proposes/Addresses/Investigates a novel or unique idea, question, format, or approach to address the position. Note: this doesn't mean that the student was entirely responsible for the experimental design, but merely that the question, approach, or investigation was novel or innovative.						
3. Process / Method Discipline-specific approach to addressing the idea, question, claim, or hypothesis.	Clearly identifies a process or approach to accomplish an end product						
	Explains why the specific process or approach was chosen						
	Examines and investigates the relationship between disciplinary practice(s) and the approach used (Novelty? Differences? Pros and cons of approach? etc.)						
4. Conclusion / Outcome A synthesis of key discoveries drawn from evidence or the research process. How results apply to larger context or real world.	Presents evidence gathered and/or elements of process leading to the conclusion/outcome						
	Clearly articulates and effectively defends clearly the conclusion/outcome with evidence (data, discoveries, theories)						
	Illustrates the significance and analyzes the implications of conclusion/outcome						
	Evaluates the impact or relevance of conclusion/outcome as it relates to contemporary social/ethical issues						
5. Presentation / Display Visual presentation of project materials.	Displays research in a visually compelling manner with attention to detail and precision in visual presentation						
	Skillfully presents a complete, well-organized display of research						
6. Presenter Oral presentation of the content of the project.	Engages audience actively and effectively with confidence						
	Communicates skillfully about the full project						
	Answers inquiries knowledgeably						
	Exhibits a professional demeanor in appearance and communication						

Please write any additional comments for the student on the reverse of this sheet.

Evaluator's rating:

Based on your past and current experience as a teacher, check only one box below that best represents the OVERALL QUALITY of this project and presentation.

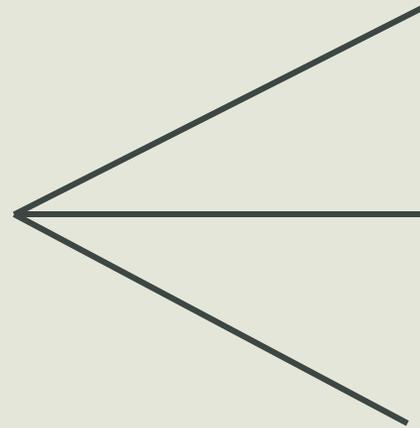
A+ A A- B+ B B- C+ C C- D+ D F

ELEMENT	CRITERIA (check ✓ an appropriate box in each row)
1. Student Position The perspective, thesis, hypothesis, idea, or claim that inspired the project.	Clearly articulates or proposes the position (perspective, thesis, hypothesis, idea, or claim) that inspired project
	Locates their position within larger disciplinary context (i.e. the big picture)
	Makes connections from the molecular to the systems level or higher
	Analyzes the complexity of the position, synthesizes other points of view, and evaluates limitations of project
2. Novel Contribution/ Innovative Thinking Novelty or uniqueness of idea, claim, question, form, etc.	Proposes/Addresses/Investigates a novel or unique idea, question, format, or approach to address the position. Note: this doesn't mean that the student was entirely responsible for the experimental design, but merely that the question, approach, or investigation was novel or innovative.
3. Process / Method Discipline-specific approach to addressing the idea, question, claim, or hypothesis.	Clearly identifies a process or approach to accomplish an end product
	Explains why the specific process or approach was chosen
	Examines and investigates the relationship between disciplinary practice(s) and the approach used (Novelty? Differences? Pros and cons of approach? etc.)
4. Conclusion / Outcome A synthesis of key discoveries drawn from evidence or the research process. How results apply to larger context or real world.	Presents evidence gathered and/or elements of process leading to the conclusion/outcome
	Clearly articulates and effectively defends clearly the conclusion/outcome with evidence (data, discoveries, theories)
	Illustrates the significance and analyzes the implications of conclusion/outcome
	Evaluates the impact or relevance of conclusion/outcome as it relates to contemporary social/ethical issues
	Integrates knowledge across disciplines to effectively support the conclusion/outcome
5. Presentation / Display Visual presentation of project materials.	Displays research in a visually compelling manner with attention to detail and precision in visual presentation
	Skillfully presents a complete, well-organized display of research
6. Presenter Oral presentation of the content of the project.	Engages audience actively and effectively with confidence
	Communicates skillfully about the full project
	Answers inquiries knowledgeably
	Exhibits a professional demeanor in appearance and communication

Please write any additional comments for the student on the reverse of this sheet.

- Specifically evaluates course learning goals/ outcomes
- Primarily developed for grading

Aligning Outcomes for Assessment

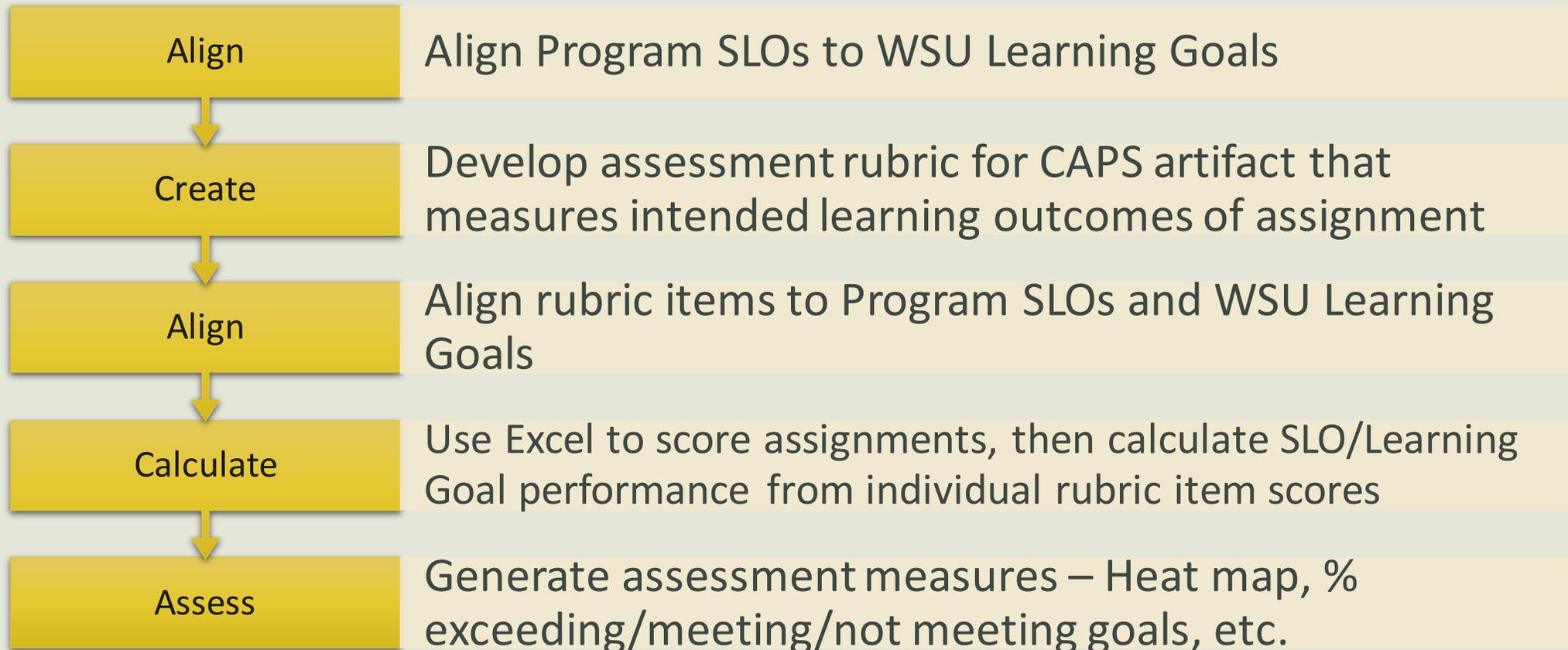


Course SLOs/Assignment criteria

Neuroscience Program SLOs

WSU Learning Goals/UCORE CAPS goals

From Assignment to Assessment



Element	Criteria	CAPS Learning Goal				
Student Position	Clearly articulates or proposes the position (perspective, thesis, hypothesis, idea, or claim) that inspired the project	Critical Thinking, Scientific Literacy				
Student Position	Locates their position within the larger disciplinary context (i.e. the big picture)	Critical Thinking, Scientific Literacy				
Student Position	Makes connections from the molecular to the systems level or higher	Critical Thinking, Scientific Literacy				
Student Position	Analyzes the complexity of the position, synthesizes other points of view, and evaluates limitations of the project	Critical Thinking				
Novel Contribution/Innovative Thinking	Novelty or uniqueness of idea, claim, question, format, etc. - Proposes/addresses/investigates a novel or unique idea, question, format, or approach to address the position. Note: this doesn't mean that the student was entirely responsible for the experimental design, but merely that the question, approach, or investigation was novel or innovative.	Integrated Learning/Scientific Literacy				
Process/Method	Clearly identifies a process or approach to identify an end product	Integrated Learning/Scientific Literacy				
Process/Method	Explains why the specific process or approach was chosen	Integrated Learning/Scientific Literacy				
Process/Method	Examines and investigates the relationship between disciplinary practice(s) and the approach used (novelty? differences? pros and cons of approach? etc.)	Integrated Learning/Scientific Literacy				
Conclusion/Outcome	Presents evidence gathered and/or elements of process leading to the conclusion/outcome	Information Literacy				

1. Stu	1. Stu	1. Stu	1. Stu	2. No	3. Pro	3. Pro	3. Pro	4. Col	5. Pre	5. Pre	6. Pre	6. Pre	6. Pre	6. Pre	Evalu	r's Rati					
2	3	1	2	3	3	2	2	3	3	3	2	2	3	3	3	2	2	2	3	A-	9
4	3	3	2	3	3	3	2	3	3	4	3	2	3	4	4	4	4	4	4	A-	9
2	3	3	2	3	3	3	3	3	3	4	3	2	3	3	3	3	2	2	4	B+	8
2	2	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	B+	8
2	2	2	1	2	3	2	2	3	3	2	0	1	1	1	4	2	2	2	4	B+	8
3	3	3	2	3	3	3	2	3	2	2	2	2	3	3	3	3	2	2	4	A-	9
3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	B+	8
4	3	2	3	2	3	3	3	2	3	2	0	1	3	4	3	3	3	3	4	A	10

CRITICAL THINKING	INTEGRATED LEARNING	INFO LIT	COMM	SCI LIT	WRTG
13	12	6	16	27	6
19	13	6	23	38	7
17	14	6	18	34	6
12	12	4	12	26	4
9	10	6	14	22	2
15	13	5	18	31	6
14	10	4	12	26	4
14	12	5	20	29	7

Know1 - 16	Know2 - 8	Skill2 - 20	Skill3 - 24	Skill4 - 20	Skill5 - 8	Att1 - 12	Att2 - 8
8	5	13	16	12	6	6	5
14	6	13	23	13	7	8	5
10	6	14	18	14	7	8	6
8	4	11	12	12	4	6	5
8	2	11	14	10	5	5	4
11	5	12	18	13	4	8	5
10	5	10	12	10	4	7	4
12	3	13	20	14	5	6	5

Heat Map – quick/easy comparison year to year

CRITICAL THINKING	INTEGRATED LEARNING	INFO LIT	COMM	SCI LIT	WRTG
16	13	6	19	33	6
12	12	5	15	26	4
15	11	5	17	30	6
18	13	5	15	32	5
15	14	6	18	33	6
19	15	7	19	39	6
15	13	5	19	31	6
19	16	7	20	37	7
16	13	5	17	32	5
12	10	4	12	23	4
16	12	6	21	32	7
21	18	7	20	42	7
16	14	5	15	32	5
23	18	8	24	45	8
15	13	5	16	30	5
19	16	6	21	39	6
20	17	7	23	42	7
21	19	7	22	44	7
15	11	4	20	29	7
16	16	3	22	35	7
16	14	5	19	33	6
18	14	7	22	35	8
16	13	5	18	33	5
22	18	7	22	43	8
21	18	8	23	42	8
15	17	7	20	35	7
19	18	8	24	41	8
17	11	4	19	32	7
15	12	5	15	29	4

2022

CRITICAL THINKING	INTEGRATED LEARNIN IL	COMM	Sci Lit		
22	19	6	24	45	
10	8	4	13	20	
17	15	6	20	35	
13	12	4	22	30	
21	17	7	21	37	
20	18	5	18	36	
19	16	7	21	38	
16	12	6	19	22	
14	15	6	17	36	
11	10	4	11	25	
13	12	5	14	19	
21	15	7	21	36	
21	19	8	24	45	
24	20	8	23	48	
16	13	5	18	34	
20	18	7	21	44	
20	14	4	17	38	
21	17	7	21	36	
17	20	8	24	45	
20	17	6	21	34	
22	18	7	23	45	
18	14	6	18	31	
19	17	7	23	39	
18	17	2	24	39	
12	32	11	4	14	25
19	17	7	20	30	

2021

More information....

WSU Learning Goals

<https://ucore.wsu.edu/about/learning-goals/>

Office of Assessment for Curricular Effectiveness (ACE)

<https://ace.wsu.edu/>

<https://ace.wsu.edu/2021/12/06/efficient-assessment-of-senior-majors-aligning-grading-rubrics-with-program-learning-outcomes-neuroscience/>

Thank you to the ACE team for all of your support!

Student Learning Outcomes for BS neuroscience majors

Knowledge:

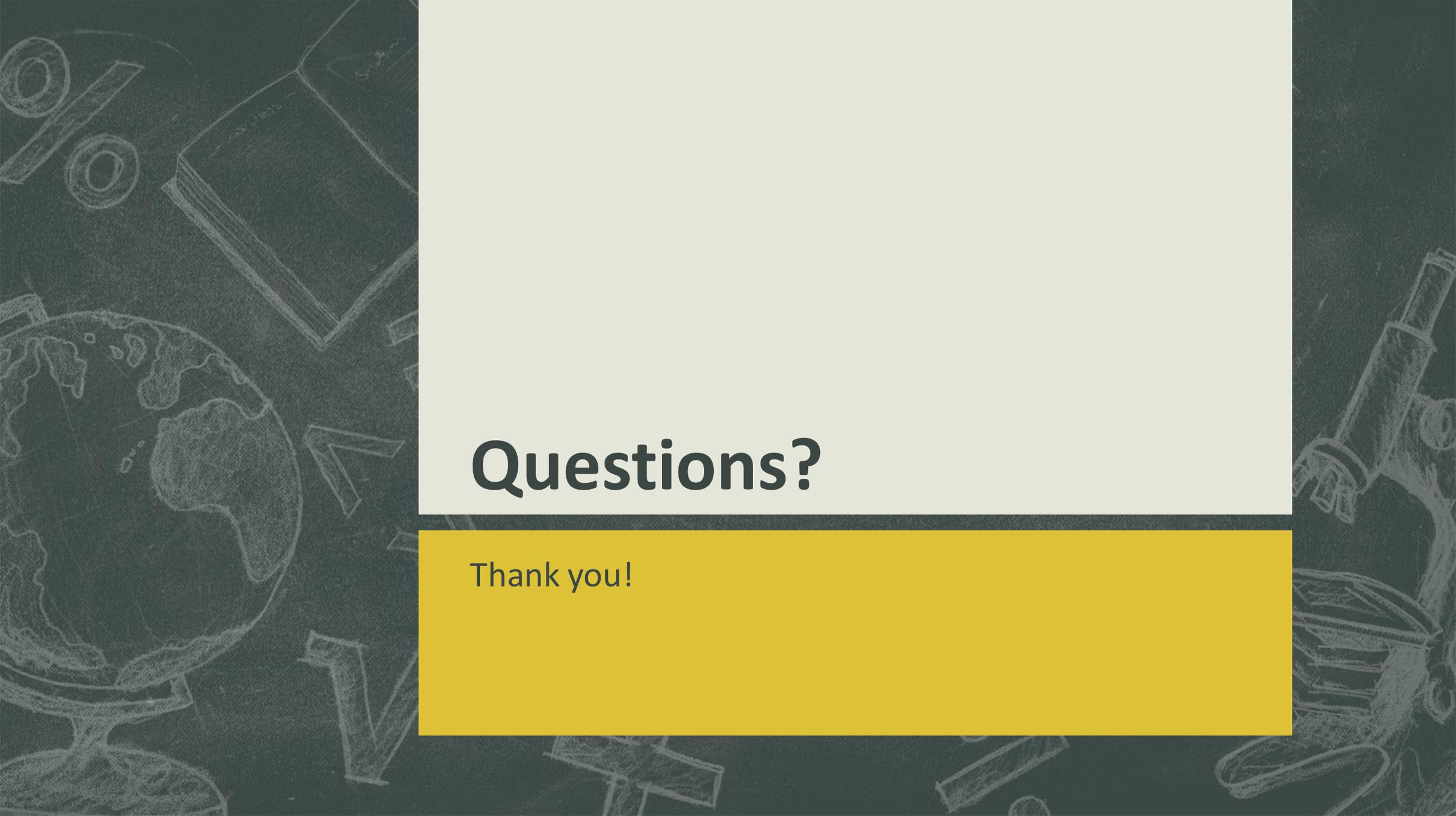
- Demonstrate knowledge of, and recognize the relationships between, the structure and function of molecules and tissues involved in neurobiological systems at all levels: molecular, cellular, and organismal.
- Recognize the impact that science has on culture, and vice versa.

Skills:

- Perform basic laboratory techniques used in neuroscience research and understand and apply principles of laboratory safety.
- Locate and retrieve scientific information and read, understand, and critically evaluate primary literature.
- Prepare oral and written reports in a standard scientific format.
- Apply the scientific process, including designing, conducting, and evaluating experiments and testing of hypotheses.
- Use mathematics and statistics to evaluate scientific evidence and interpret graphs and tables.

Attitudes

- Recognize that all areas of science are integrated and interconnected.
- Appreciate scientific knowledge as something that is not static, but constantly expanding through the ongoing work of researchers.
- Value ethical conduct in science.
- Recognize that the best decision-making and policies are based on evidence.

The background features a dark grey, chalkboard-like texture with various white line drawings of educational items. On the left, there is a globe on a stand. Above it, a pair of scissors and a ruler are sketched. In the center, a stack of books is visible. On the right, a microscope is drawn. At the bottom, there are sketches of a satellite and other geometric shapes.

Questions?

Thank you!