

**Table 1. Curriculum Roadmap**

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| <p><b>1. Making science</b><br/>(2–3 class periods)</p>   | <p><b>1A. Asking human brain and behavior research questions</b><br/> <b>Lesson:</b> Students learn about the ingredients of a good research question. What makes a question relevant, generalizable, and testable?<br/>           Students begin by exploring how they encounter everyday questions in science, and start to develop language to describe the nature of scientific inquiries.<br/> <b>MindHive Activity:</b> Students browse and explore the public MindHive study bank, comprising studies created by scientists, students, or both.</p> <p><b>1B. The scientific process</b><br/> <b>Lesson:</b> Students learn how scientists communicate with each other and with the public at different stages of the research process. How can the scientific community strike the appropriate balance between rapid discovery and scientific rigor?</p>   |
| <p><b>2. Involving the public</b><br/>(2–3 class periods)</p>   | <p><b>2A. Science communication</b><br/> <b>Lesson:</b> How can science communication be accurate and complete without being too complicated for the public to understand? What does “trust the science” mean and what role can and should scientific discovery play in our everyday lives?</p>  |
|   | <p><b>2B. Citizen science</b><br/> <b>Lesson:</b> Students learn about different models of citizen science and discuss the values and possible limitations of scientist-public partnerships.<br/> <b>MindHive Activity:</b> Students participate in and reflect on a student/scientist-initiated MindHive study on mental health and learning during the COVID-19 pandemic (the Pandemic Citizen Science Study; see text).</p> <p><b>2C. Human subjects</b><br/> <b>Lesson:</b> Students learn about benefits and pitfalls related to conducting science on human research subjects through examples from the past and present. Students experience and reflect on what it’s like to be a human subject, and engage in class discussions about how science and society should approach data from human subjects.<br/> <b>MindHive Activity:</b> Students’ explore and reflect on student-initiated studies on the MindHive platform.</p> |
| <p><b>3. Human brain and behavior research: methods, basics, and case studies</b><br/>(2–5 class periods)</p> | <p><b>3A. Brain and behavior research: Making science</b><br/> <b>Lesson:</b> Students learn about basic human neuroscience concepts and the tools used by neuroscience and psychologists to understand how our brains support and explain our behavior.<br/> <b>MindHive Activity:</b> Students explore the public task and survey bank and pick a few favorite tasks and surveys to discuss with their class.</p>  |

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|   | <p><i>3B. Risk taking and adolescence</i></p> <p><b>Lesson:</b> Students learn about dopamine as it relates to age, risk taking, and mood.</p> <p><b>MindHive Activity:</b> Students participate in and reflect on a scientist-initiated MindHive study exploring the relationship between risk-taking and anxiety.</p>   |
|   | <p><i>3C. The social brain / environmental neuroscience</i></p> <p><b>Lesson:</b> Students learn about the social brain and how empathy and social influence can explain human behavior.</p> <p><b>MindHive Activity:</b> Students participate in and reflect on a scientist-initiated MindHive study that explores the social factors that determine behavior choices as they relate to climate change.</p>                              |
|   | <p><i>3D. Mindfulness</i></p> <p><b>Lesson:</b> Students learn how different parts of the human brain map onto different brain functions through different types of mindfulness meditation.</p> <p><b>MindHive Activity:</b> Students participate in and reflect on a scientist-initiated MindHive study about the relationship between mindfulness and cognitive control.</p>  |
| <p><i>4. Designing a human brain and behavior study (3–6 class periods)</i></p> | <p><i>4A. Coming up with a research question</i></p> <p><b>Lesson:</b> Students revisit Lesson 1A (what makes for a good research question?) and reflect on the MindHive studies they've participated in thus far.</p> <p><b>MindHive Activity:</b> Students create a template for their own MindHive study and proposal: They generate a research question and explore existing research related to their topic of interest.</p>         |
|   | <p><i>4B. Designing a study that addresses your research question</i></p> <p><b>Lesson:</b> Students learn how to translate their research question into testable hypotheses and create an appropriate study design.</p> <p><b>MindHive Activity:</b> Students continue to explore the public tasks and survey bank with their research question in mind and combine tasks and surveys (or create their own) to finalize their study.</p> |
|   | <p><i>4C. Communicating your study to peers and participants</i></p> <p><b>Lesson:</b> Students revisit Lesson 2A (science communication) and Lesson 2C (human subjects) and discuss the differences between scientist- and participant-facing communication.</p> <p><b>MindHive Activity:</b> Students finalize their study proposal (peer-facing) and study page (participant-facing).</p>  |

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| <p><i>5. Peer review and study revision</i><br/>(2–3 class periods)</p>   | <p><i>Best practices in peer review</i><br/><b>Lesson:</b> Students revisit examples from Lesson 1 and learn about and discuss principles and best practices of peer review. They further discuss how to revise studies based on peer feedback.</p>   |
|   | <p><i>5A. Self-review and study revision</i><br/><b>MindHive Activity:</b> Students review their <i>own</i> study proposal to (a) test the review process (esp. what makes for a good review?), and (b) make any final changes to their study proposal before sharing it with other students.</p>   |
|   | <p><i>5B. Peer review and synthesis</i><br/><b>MindHive Activity:</b> Individual students first provide peer feedback to studies designed by students from another class and then discuss and synthesize their reviews as small groups.</p>   |
|   | <p><i>5C. Final study revisions</i><br/><b>MindHive Activity:</b> Students revise their study based on the reviews they received, and collect / review pilot data from their classmates before finalizing their study.</p>  |
| <p><i>6. Data collection, analysis, and synthesis</i><br/>(2–3 weeks)</p> | <p><i>Best practices in data collection, analysis and interpretation</i><br/><b>Lesson:</b> Students revisit examples from Lesson 1 to discuss best practices in data collection and analysis, including topics like sample size and the relationship between study results and interpretation.</p> |
|   | <p><i>6A. Data collection</i><br/><b>MindHive Activity:</b> Students distribute and advertise their studies on MindHive and among their own communities. They review data sets as they come in.</p>   |
|   | <p><i>6B. Data analysis</i><br/><b>MindHive Activity:</b> Students use the MindHive Analysis interface and guides to analyze and synthesize their research data.</p>  |
|   | <p><i>6C. Synthesize and communicate findings</i><br/><b>MindHive Activity:</b> Students work on the Discussion and Conclusion sections of their study proposal and finalize their study report.</p>  |