"Question Brainstorms" Learning Object

Link to online version: https://fl-rda.org/question-brainstorms-learning-object/

Title	Question Brainstorms
1-sentence summary	For rapid generation of questions spanning disciplines around a topic
Time to implement	25-50 minutes
Purpose of tool	● Enable the generation of both disciplinary and multidisciplinary questions targeting a complex problem ● Provide opportunity for all members of a group to contribute possible avenues for future investigation ● Create connections among members of a diverse collaborative group through shared questions of interest
Example output	
The steps	The following process asks for members of a multidisciplinary team to generate questions (i.e., areas of interest, questions of curiosity) related to an overarching topic. With a relatively new collaboration, this activity is best completed in two phases, following the steps of generating and labeling questions according to the disciplines they represent and working together to ultimately create multi-disciplinary questions. This activity can form the basis for later generating multidisciplinary research questions that emerge from the top-rated question outputs and can be pursued collaboratively. **This activity can be conducted in person or virtually**, using either a large piece of paper with markers or a virtual whiteboard where text can be added. For virtual engagement, consider Microsoft's Whiteboard, Mural.co, or another tool.

Phase I: Question Generation and Labeling
(10-20 minutes)

In the first phase group members generate questions freely related to a chosen topic and then label questions according to the disciplinary perspective they take.

1. Each group needs a broad topic to use as a prompt to generate questions around. In the case of groups aimed at conducting research, a complex societal problem is helpful for providing points of entry for multiple disciplines.
2. With the topic prompt written clearly at the top of a large piece of paper or (virtual) white board, members are invited to rapidly generate questions in response to the prompt. The questions can be more general in nature, relating to curiosity about the topic or opportunities for clarification, but they can also take the form of questions aligned with members' research interests. *Importantly, since the goal is to be open and generative in this phase, these questions need not (and likely should not) be formulated as research questions.* Each question should be shared aloud and a scribe should write down the question exactly as stated in a numbered list.
3. The group should not stop to analyze the questions or provide feedback on them at this stage. Instead, the generation of as many questions as possible within a time limit (typically 5-10 minutes) should be encouraged.
4. At the end of the 5-10 minute time period, members should stop generating questions and spend another 5-10 minutes labeling each question, to the extent possible, with the discipline(s) related to each.
   - For example, with a question prompt such as red tide, a question from a **biological** perspective could be "What are the effects on fish populations and marine ecosystems?", one from a **biomedical** perspective may ask "What are the impacts on human health and good safety?", and from an **economic** perspective could be "How does it influence local businesses, especially those reliant on fishing and tourism?" *(Label each question with the relevant disciplinary name(s).)*
   - Importantly, the labeled discipline does not have to be the discipline of the person who initially generated the question; a broader more conceptual approach can be taken.
5. After the labeling of each question with discipline(s), the team may pause this activity and complete an interim activity to learn more about each member's overlapping interests, such as the **Lightning Presentations activity**. If the team is already familiar with each other's interests, they may proceed to the next phase.

	Phase II: Question Combining and Prioritizing *(15-30 minutes)* With knowledge of each other's similar and complementary interests (through prior knowledge or completion of an activity such as the **Lightning Presentations activity**), the team will aim to produce and prioritize "multidisciplinary" questions in this phase. 1. Using the labeled questions from Phase I, members should find ways to combine questions to create overarching questions that combine multiple disciplinary perspectives. Members may also generate new multidisciplinary questions. *(If members create new unidisciplinary questions, they should be encouraged to add to them with existing questions or new ideas to make them multidisciplinary.)* • For example, using the same question prompt as above ("red tide") and the unidisciplinary questions listed above, a multidisciplinary question that incorporates all three disciplinary perspectives could be "How does red tide affect community resilience in coastal regions, considering environmental, health, and economic vulnerabilities?" *(Label each multidisciplinary question with the relevant disciplinary names.)* 2. Toward creating questions with overlapping interest areas, members should be encouraged to move beyond the questions they generated in the first phase and try to generate questions that represent their shared interests. 3. As they are created, the new multidisciplinary questions should be labeled with the disciplines they represent. 4. This multidisciplinary question generation should be allotted 10-20 minutes. At the end of this time, members should spend 5-10 minutes to place a star symbol next to the top three questions they would be interested in discussing further. The accumulation of stars in a subset of multidisciplinary questions on the list will show opportunities for collaboration across members of this group.
The outcome	**A list of multidisciplinary questions, collaboratively generated**, that capture individual and shared interests around a central topic. This list can be used as a starting point for later discussions in a research collaboration about investigative paths to pursue.
Example use cases	**Uncovering Collaborative Potential** What this activity does well is provide a space for the rapid generation of questions from multiple perspectives around a core topic or challenge. Once individuals on a team better understand each other's perspectives on the topic (via the questions they

	produce), and have further opportunity to understand their overarching interests and areas of expertise (through an initial or interim activity), they will be better prepared to generate questions that combine their individual interests with those of their teammates'. When these combinations happen, say, in an multidisciplinary research team or group of individuals considering engaging in a collaboration, it can provide a path forward for talking about what their collaborative efforts could be targeted at. As such, this activity may be helpful to use at networking events to spark future collaborations, such as those targeted at complex societal problems. **Reinvigorating Long-Standing Teams** For ongoing collaborations, research-focused or otherwise, it can be difficult to ideate new directions for the group. This activity is a great intervention for stale collaborations to reinvigorate excitement around a new (or new facet of an old) topic and see opportunities for alternative lines of inquiry. Though the focus of the activity is on questions, participants are not encouraged to generate *research* questions, but rather to focus on what they are curious about or want to know more about. This freer mode of thinking can help lead to innovative ideas or methods for designing research projects.
Q&A:	
- When should this be applied?	This activity is helpful for **new collaborations** to generate ideas for what their combined efforts could be. For a new team with members who do not know each other, it is important to have an initial step before Phase I or interim step between Phases I and II (e.g., **Lightning Presentations activity**) so that members can better understand how their interests overlap and enable them to generate questions that touch on multiple members' interests in Phase II of the activity. It is also helpful in considering possible guiding questions and related project ideas in relation to **complex problems**, which typically requires multiple perspectives and stakeholders to address. Through this process, group members are encouraged to think about how their combined efforts have the power to investigate the complex problem more thoroughly.
- When *not* to use this?	Since this activity targets a stage early in the team, when ideas are being generated, it is unlikely to be useful for groups already engaged in ongoing projects. If an existing team wishes to explore new project paths, then this activity could be useful for expanding or redirecting ongoing collaborations.
- What should I do	The final phase of this activity equips the group with a small set of

next?	multidisciplinary questions that are of interest to them. A next step in considering how to move forward as a team could be to create a conceptual model that more fully characterizes the topic and problem space they are targeting with their questions. A helpful conceptual model may be a "problem tree." See guidance on creating a **Problem Tree here**.
- What evidence or sources is this based on?	This activity is an evolution of the basic steps of the **"Question Formulation Technique" (QFT)**, which solicits question generation from a group in response to a prompt. Some modifications in the language used to describe the steps and additions such as the disciplinary labels, use cases, and how to implement this with multidisciplinary teams are new contributions.
- What if I want to learn more? What are other complementary tools?	As noted in response to the prior question, this activity is heavily inspired by the "Question Formulation Technique" (QFT). Access more info on the **QFT website**, which houses many resources for using their simple question generation technique in a variety of settings.

Phase I – Question Generation & Labeling

<u>Prompt: Red Tide</u>

1. Question idea (BIO)
2. Question idea (ECON)
3. Question idea (MED)
4. ...

Phase II – Question Combining & Prioritizing

<u>Prompt: Red Tide</u>

1. Question idea (BIO + ECON)
2. Question idea (ECON + BIO)
3. Question idea (BIO + MED)
4. Question idea (BIO + ECON)
5. Question idea (ECON + BIO + MED)
6. ...