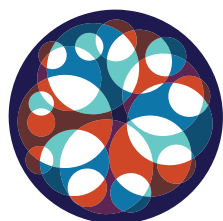# Sciberbrain

DIALOGUE FACILITATION HANDBOOK

A five-stage process to engage learners in discussions about new or controversial developments in science.

1. Provide a knowledge base
2. Create an atmosphere
3. Present a stimulus
4. Generate questions
5. Facilitate a discussion

BIOCHEMICAL SOCIETY

1.   Provide a knowledge base

If you want students to discuss a scientific or technological development, you will need to provide them with a scientific knowledge base. The topic you choose could be something from the curriculum or you could look at something that has been in the news recently.

If you are making your own scientific knowledge base, you may like to provide information on:

- Some technical details of the process/concepts
- What scientists are able to do now
- What scientists hope to be able to do in the future

There are some animated slide-shows which are freely available on www.sciberbrain.org that you may find helpful for providing a 20-minute introduction to the following topics:
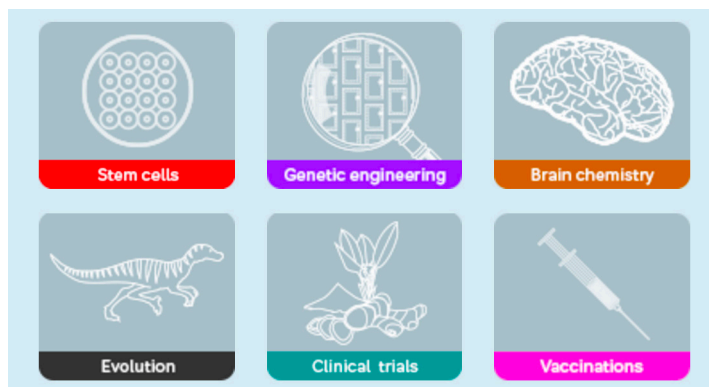
Top tip
Present the knowledge base in lesson time or get students to explore SciberBrain activities for homework
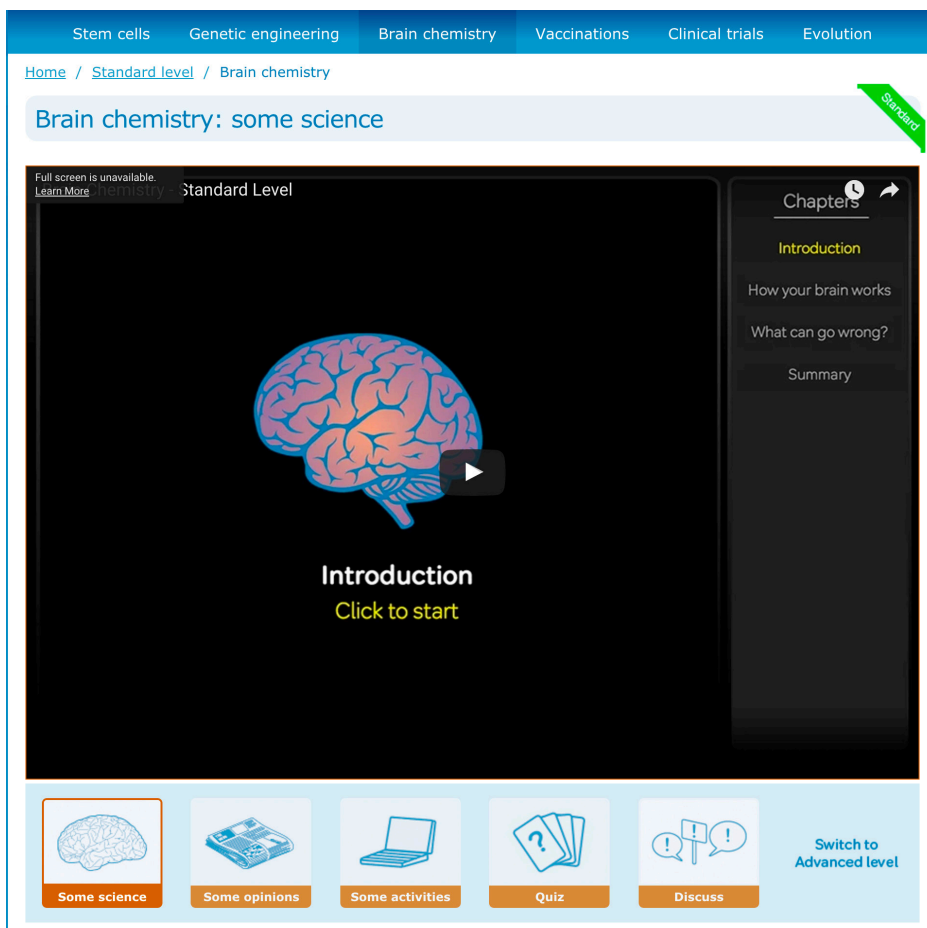
2. Create an atmosphere

Set the scene

Before your class arrives, gather together everything you will need (this might include a science presentation, a stimulus, paper, pencils, marker pens, voting tokens and a flip-chart).

Where possible, arrange seating in a circle with no desks or tables in between so that all participants, including yourself, can see and hear everyone else clearly. Upon arrival, explain to the students that the room is arranged this way to enable dialogue between them.

Inform students that today they will become a 'community' of learners where they will be formulating their own questions, deciding the discussion agenda and learning through a collaborative exploration.

Inform students of the session's aims. These might include team building and thinking skills as well as the subject specific learning objectives.

Warm-ups and ice-breakers

Enquiry is an open-ended, collaborative and creative way of learning, so try to set this mood from the beginning. Stress that there will be disagreement, perhaps confusion, and sometimes no right answers. Tell the students that creative and unusual thoughts are welcome and appreciated. Make clear that the enquiry belongs to the students – that it's their journey into their own questions.

Starters can be useful to get everyone in the group engaged and contributing. Some help students get into collaborating, some into connecting concepts or analysing, and some can be used to introduce particular themes and concepts. Use them before or after the stimulus. Here are seven starters you might like to try:

- **Collective Sentence.** Make a sentence using one word each in turn. Start by modelling a 10-word sentence with a partner, using 1 word each alternately. Then put students into pairs and have each pair make a 10-word sentence. Then go for a full circle.
- **All Sit Down.** Without gestures, words or sequences, all sit, one at a time. Two at the same time? Stand up and try again! Ask for help in how we might make it work better.
- **Eye-Contact Shuffle.** Have everyone look around at eye level. If someone meets the gaze of someone else, they swap places.
- **Odd One Outs.** Take 3 things or 3 pictures. Ask which is the odd one out and why. See how many ways of finding an odd one you can generate.
- **I Am the Sun.** Start by standing in the middle and saying 'I am [e.g.] the sun.' Invite a volunteer to join you and say I am...? (something related). Gets a third person to join saying I am....? (something related to both). Choose two to sit down, and get the one who stays in to start a new round.
- **Ask a Thing a Question.** A bottle, a ten pound note, a key ring... Get students to ask it a question. How many questions can we ask the thing? Are some more interesting than others? Why?
- **Here's the Answer – What is the Question?** Give an answer and try to get lots of different possible questions. Start with fun examples like 'banana' then move to more difficult ones like 'life', or examples related to the topic of study.

> **Top tip**
> Take a moment after completing a starter to ask for reflection about why you used it, whether it contributed to learning and how it felt.
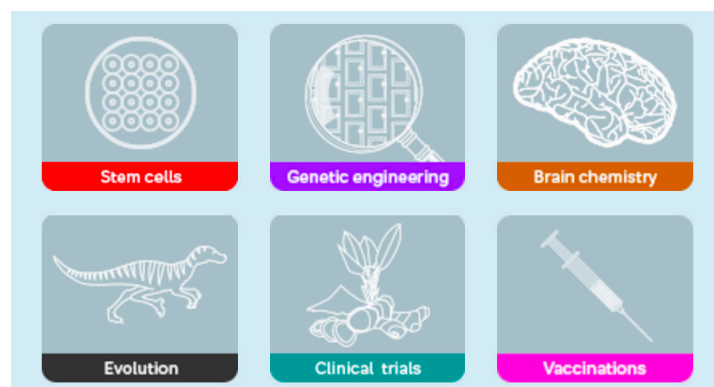
3. Present a stimulus

The stimulus

To generate thinking about the implications of a scientific or technological development, it is useful to provide a thought-provoking stimulus, perhaps about controversial aspects of the implications and applications of the science and technology.

The stimulus can take virtually any form, but short video clips and news reports are particularly good. Try to locate something that can be presented in a few minutes, that addresses the central concepts of the topic area and that you think will be engaging for everyone.

There are some examples of stimuli available in the 'opinions' sections for each of the following www.sciberbrain.org topics:

4. Generate questions

Make questions

- Allow some thinking time for students to identify issues and concepts arising from the stimulus presentation, perhaps pause for a minute of silent thought or ask individuals to jot down key words. Invite students to share their thoughts with a partner, a small group or the whole group.
- Arrange the students into small groups (5 - 6 groups works well) to generate questions raised by the science and provoked by the stimulus. Invite students to move into small circles of chairs for this.
- Ask each group to produce around 10-20 questions in a limited time.
- Ask each group to sort their questions into 2 categories: 'closed questions' (where the question could, in principle, be answered by an expert or by looking in a textbook) and 'open questions' (where answering may be difficult due to disagreements and difficulties over meanings and values). They could underline the open questions or use highlighter pens.

Select questions

The aim here is to make an informed selection of one question to frame the community dialogue. There are 5 stages to selecting the question:

- Get group members to negotiate between themselves to select one 'open question'. You may want them to focus on questions which will require some scientific knowledge to answer. Each group will put a question forward but only one will be chosen to start a community dialogue.
- When each group has chosen one 'open question' to put to the vote, have them write the question boldly on a sheet of paper to place on the floor in the centre of the room so all questions are displayed. Ask fast-finishers to think about what information they might need to answer their question. Reconvene the circle.
- Check if anyone needs any clarification on any question, then air the questions by asking students to find links between them, discuss what knowledge might be relevant and what words might need defining.
- After airing, have the students choose one question for community dialogue by one of the following voting methods:

   Omnivote. Students vote for as many questions as they like. Read out each question in turn and have students indicate if they are happy to start with that one. The question with most votes is selected.

   Token vote. Put the questions on the floor and have students place a token on their favourite. As an alternative, give them 3 tokens each so they can spread preferences between questions.

   Secret vote. Number the questions and have students write down the number of their choice on a folded piece of paper.
- When a question has been selected ask groups again if they need any words defining and discuss what scientific knowledge might be relevant for the discussion. These could be dealt with by the teacher immediately if they are straightforward or written on the board to research later.

5. Facilitate a discussion

Agree the rules

For effective whole-group dialogue, it's important to establish some ground rules and protocols. These might evolve over time but good ones to start with are:

- Only one person speaks at a time, and everyone listens.
- People comment on the point, not on the person making it.
- Participants give reasons for what they say.

Get the dialogue started

- Make sure the circle is tight and remind everyone that the aim is to follow on from others to build one big conversation. Reinforce the use of thumbs to indicate readiness to speak and assure everyone that they will get several chances to be heard. Perhaps suggest some good dialogue stems such as 'following on from…' or 'building on…' or 'I disagree with X because…'
- Begin the dialogue by asking the group that came up with the question to share how they came to it. Invite other members of that group to comment.
- Next, invite others students in the circle to respond. Perhaps ask them to try to answer the question, give their opinion or add to what has been said.

> **Top tip**
> Ask students to use thumbs-up (rather than hands-up) to indicate that they are waiting to speak

Keep the dialogue going

Your role as dialogue facilitator is to start and keep the dialogue progressing. You should manage the process so as to enable dialogue between students, not to correct them or input your expertise. Aim to be a 'guide on the side' not a 'sage on the stage'.

Sometimes the dialogue will race ahead, perhaps in more than one direction, then your job will be to keep order. Sometimes it may stutter and need helping along. Here is a list of useful prompts. Use them to keep dialogue on track, progressing and flowing.

- Ask for clarity: Can you say a bit more? Do you mean...?
- Ask for reasons and evidence: Can you say why? Can you give us a reason?
- Generalize: Is that always true? Are there any exceptions?
- Explore alternatives: How is that different? Would anyone disagree with that?
- Explore consequences: What would follow from this? What if that were true?
- Invite building: Can anyone help? Who can add something?

> **Top tip**
> Paraphrase or ask for more detail to make sure everyone is up to speed with what is being discussed.

Facilitating dialogue takes skill and practice, but here are some of the basics of managing dialogue effectively:

- Do allow time for thoughtful responses.
- Do model careful and respectful listening.
- Do show open-mindedness and interest.
- Don't use evaluative language like 'good' or 'correct'.
- Don't provide your own answers, beliefs or interpretations.
- Don't allow monologues or duologues to dominate.

Top tip

If things are slow, have students 'pair and share' then come back and share their thoughts.

Final words

- End the dialogue with an opportunity for students to share final reflections on the topic. A round of 'last words', in which each person in turn has a chance to speak without reply, can be beneficial. Invite students to sum up what they have been thinking, give their considered opinion, say if they've changed their mind or voice further questions.
- Leave time at the end of the dialogue for students to think together about the learning processes. Try putting students into pairs to evaluate aspects of the teaching and learning, e.g. the stimulus used, the voting, starter, or the quality of their interactions. Perhaps have students record a plus, a minus and an interesting feature of the session. Ensure students share their reflections with the whole group.

Top tip

Simple questions often work well for promoting process reflection: What did we think of the question? What did we like best about today? What did we do well? What might we do differently next time?

Suggested timings for lessons

Activity	Details	45 minute lessons	60 minute lesson	90 minute lesson
Provide a knowledge base	Direct students to prepare for a discussion by exploring your chosen topic on www.sciberbrain.org	For homework or in a previous lesson	For homework or in a previous lesson	30 mins
Create an atmosphere	Try a couple of starters from page 3 And reflect on why you used it	5 mins	5 mins	5 mins
Present a stimulus	There are some examples of stimuli available in the 'opinions' sections for each of the www.sciberbrain.org topics or you could find a short video clip or news item yourself	5 mins	10 mins	10 mins
Generate questions	Arrange students into five small teams to generate questions raised by the science and provoked by the stimulus. Teams should then negotiate to select one 'open question' to pitch to the whole class before everyone votes.	15 mins	15 mins	15 mins
Create an atmosphere	Try a couple more starters and reflect on why you used them	0 mins	5 mins	5 mins
Facilitate a discussion	Begin the dialogue by asking the group that came up with the question to share how they came to it. Invite other members of that group to comment.	15 mins	20 mins	20 mins
Summing up	A round of 'last words', in which each person in turn has a chance to speak without reply. Invite students to sum up what they have been thinking, give their considered opinion, say if they've changed their mind or voice further questions	5 mins	5 mins	5 mins