



Who Should Get the Helium? Community of Inquiry

YEAR 7
PHYSICAL SCIENCES



QGC

FUTUREMAKERS



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This partnership aims to engage and inspire people with the wonder of science, and increase the participation and performance of students in STEM-related subjects and careers — creating a highly capable workforce for the future.

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EVALUATE

Who Should Get the Helium? Community of Inquiry

Teacher Resource

Students consider the ethical implications of helium use as a non-renewable resource across various industries. Students may either participate in a community of inquiry or a jigsaw activity to investigate:

- How helium is used by various industries.
- The helium shortages have been and/or are currently experienced by industry.
- Why there is a helium shortage.
- If it is possible to resolve this problem, and, if so in what ways.

The community of inquiry is a structured, dialogic process that requires participants to ask open inquiry questions, listen and think, share ideas and consider alternative viewpoints. Problematic issues and concepts are discussed collaboratively within a supportive learning environment where all views are considered and respected. Reflecting on thinking is integral to the process.

The following engagement protocols are used during the community inquiry process, and these should be included on the walls for all students to see.

- Listen attentively
- Build on and connect ideas
- Respect self, others and place
- Disagree reasonably and respectfully
- There may be many responses considered to be correct

Detailed step-by-step instructions for the community of inquiry can be seen below.

1. Prior to conducting the whole-class community of inquiry, you may like students to consider and/or research the following questions:
 - What helium shortages have been and/or are currently experienced by industry?
 - Why is there a shortage?
 - Can the problem be resolved? In what ways?

2. Share the following stimulus quote and helium uses with students.

Stimulus

“Helium supplies are tightening up. Hiccups in global helium supply lines, along with increasing demand in a growing economy, are leading to shortages of the noble gas.

According to the industrial gas firm Linde, helium supply interruptions in the Middle East and allocations of helium from the U.S. Bureau of Land Management’s Texas helium reserves have restricted the company’s ability to supply customers with this gas. Linde says it is now allocating helium in ‘a fair and reasonable way.’

There is not enough helium to go around. As representatives of Linde, how will you define ‘fair and reasonable?’”

Uses of helium

- Filling balloons (balloon rides, party balloons, blimps, meteorological research)
 - Gas-cooled nuclear reactors
 - Some neon lights
 - MRI machines (can be replaced by hydrogen)
 - In diving apparatus
 - Breathing mixtures
 - Pressurising agent (rockets)
 - Purge systems of unwanted gas
 - Leak detection
 - Shielding gas for arc welding
 - Inert atmosphere in welding
 - Food preservation
 - Cryogenics
 - Protective gas when growing silicon
 - Semi-conductors – fibre optics
 - Gas for supersonic wind tunnels
3. Inform students that it is their task is to prioritise the uses of helium in order from most to least fair and reasonable allocation of helium in times of a global shortage.

Before making this list, students should consider and discuss a selection of community of inquiry questions (see below); these questions should be selected based on your student group and their respective needs.

Ensure ways of working are shared and discussed with students prior to engaging in the community of inquiry. When answering questions, students should always provide reasons for their responses.

Community of Inquiry Questions

- Is it possible to solve the problem of the helium shortage by fair and reasonable allocation of helium?
- Are there alternatives to helium that could be considered for some of the listed uses (e.g. MRI and hydrogen)?
- Should these uses still be considered for helium allocation? Why/Why not?
- In what ways could the problem of helium shortage be solved fairly and reasonably?
- Fair and reasonable for whom? Who will the allocation benefit?
- Are these benefits widespread (i.e. for a wide range of people/communities)? How do you know that?
- What flow-on benefits might the allocation have? In what ways are the flow-on benefits significant?
- If allocations are considered to be fair and reasonable, does that mean they are also ethical? Why/Why not?
- How could an ethical approach to helium allocation be achieved or maintained?
- Should global need be prioritised over local need when considering helium allocation? Why do you think that?
- Are there some helium uses that would be considered less ethical/less important than others? Why do you think that?
- How would the amount of helium allocated to each group/use be decided upon?
- Who should have the right to make decisions regarding the allocation of helium? Why do you think that?

Following the community of inquiry, students prioritise the uses of helium using the Prioritising Helium table. Ask students to only complete the first two columns at this stage of the activity (Helium Use and Justification).

4. Return to the whole-class community of inquiry. Ensure students have their priority lists placed in front of them, so the lists are visible to all members of the community.

Students take turns to share their lists. During this time, their peers share any disagreements, including reasons for disagreement with the community. Record disagreements and reasons for disagreements as they are voiced.

After all groups have shared their lists, ask students: How would the amount of helium allocated to each group be decided upon?

5. Following the community of inquiry, ask student groups to reflect on the following questions:

- On consideration of the shared disagreement/s, should we change our priority order?
- Were the reasons we put forward ethically and logically considered?
- What have we taken away from this activity that will remain with us in future? Why do we consider this important?
- What action could we take as individuals or as a community to make a difference?

Curriculum Links

Science

YEAR 7

Science as a Human Endeavour

Science knowledge can develop through collaboration across the disciplines of science and the contributions of people from a range of cultures (ACSHE223)

Solutions to contemporary issues that are found using science and technology, may impact on other areas of society and may involve ethical considerations (ACSHE120)

General Capabilities

Literacy

Comprehending texts through listening, reading and viewing

Composing texts through speaking, writing and creating

Word knowledge

ICT Capability

Investigating with ICT

Managing and operating ICT

Critical and Creative Thinking

Inquiring – identifying, exploring and organising information and ideas

Reflecting on thinking and processes

Analysing, synthesising and evaluating reasoning and procedures

Personal and Social Capability

Self-management

Social awareness

Social management

Ethical Understanding

Understanding ethical concepts and issues

Reasoning in decision making and actions

Explain values, rights and responsibilities

Who Should Get the Helium? Community of Inquiry

Student Activity

Prioritising Helium Use

Priority	Helium Use	Justification	Disagreement
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			