



Chasing the Wind

Changing Ideas

Timetable

Teacher: Lesson:

Group: SEN students:

Date: Support Staff:

Room:

Focus

In this jigsaw activity students will work in groups to research the ways changes in technology have allowed scientists to update their ideas about how the Universe works. The group work requires good communication and interpersonal skills. The whole activity will probably take two lessons.

Objectives

Students will learn to:

- Research and explore the ideas and methods of some scientists with particular reference to source of evidence, and creativity and imagination in interpretation.

Outcomes

All students will be able to:

- Describe the ideas of one of the scientists.

Most students will also be able to:

- Explain how ideas about the Universe evolved over a period of time.

Some students will also be able to:

- Use evidence to support their arguments.

Resources

- 'Chasing the Wind' programme
- worksheet *Changing Ideas* (one per student)
- expert cards (one set of cards per group of four students)
- two computers with web access (per group) for expert and home group phases
- expert group labels attached to tables to provide expert group bases
- presentations *Preparing your presentation* and *Delivering your presentation*

Starter (15 mins)

1. If time allows show all of the 'Chasing the Wind' programme or the part that addresses the development of instruments and corresponding changes in our ideas about the Universe.
2. Tell students they should record names of scientists mentioned in the programme, the new technologies that helped the development of our ideas about the Universe, and what the scientists contributed to our understanding (e.g. interpretation of new evidence, creativity and imagination).
3. Show the programme clip again to allow students to record the information.



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Lesson 1: Research (jigsaw activity)

1. Organise students into home groups, ideally each with four students. One or more groups can have five students if numbers dictate with the additional student doubling up one of the expert's role.
2. Give each student a copy of the worksheet *Changing Ideas* and introduce the activity to the students. Emphasise key points about individual and group expectations for each stage, for example, the importance of each expert having all the answers to their question before returning to their home groups. Set time limits for each phase, for example, one lesson in expert groups and one lesson plus homework / two lessons for the home group activity. If you have shown all of the 'Chasing the Wind' programme, this would also be an opportunity to emphasize the importance of the scientific community gathering evidence and sharing idea in moving scientific understanding forward.
3. Give each group a set of expert cards to allocate amongst themselves.
4. Students read their expert card and go to the table(s) displaying their expert's name. They should work in groups of three or four so allocate two or more tables for each expert as required. Each expert group works for the duration of the lesson to find the answers to the questions on their expert card, using reference books and visiting the suggested websites. They should work in pairs, researching different questions, and use the base table to report back and assemble the answers to their questions.

Lesson 2: Feedback and presentation

1. Students return to their home groups to share their expertise. They help the home group to complete the table and answer the questions. They should explain rather than simply give the information to the group, and other group members should be encouraged to ask questions for clarification as necessary.
2. Each home group then prepares a 5 to 8 minute talk, supported by a presentation, on how ideas about the Universe have changed over time and the role of new evidence (from new technologies) and scientists in these changes. If you have shown the whole of the 'Chasing the Wind' programme this would also be an opportunity to emphasise the importance of the scientific community gathering evidence and sharing ideas to move scientific knowledge forward.

Main (90 mins)

Plenary (15 mins)

1. Debrief the activity at the end of Lesson 2 by addressing any misconceptions and emphasising key learning points, e.g. new evidence leads to scientific explanations being reexamined. Where an explanation cannot account for evidence, this may reduce confidence in the explanation.
2. Some students may question the uncertainty this activity implies in our scientific understanding. This would offer an opportunity to discuss how scientific knowledge becomes generally accepted by the science community (i.e accounts for a body of evidence, predictions from explanations are agreed with by new data).