

The jigsaw technique

The jigsaw technique was first developed in the early 1970s by Elliott Aronson and his colleagues and students in the USA. It is a structured way of engaging every student by requiring them to cooperate with each other in order to master an area of knowledge. Like completing a jigsaw, each student in a 'jigsaw group' is responsible for learning a piece of the subject matter. They do this in a temporary 'expert group' before returning to their home jigsaw group where the team members teach each other what they have learned thus enabling them all to grasp the whole picture.

The jigsaw technique:

- encourages cooperation and collaboration between students – important for achieving a better balance between competition and cooperation in students' experience of education
- improves student relationships by creating a more caring and empathetic climate in the classroom – important for achieving harmony in multicultural classrooms
- develops reading and comprehension skills
- facilitates peer teaching and learning
- boosts self-esteem and resilience
- promotes better behaviour by engaging students in their own learning and enlisting their support in classroom management
- requires personal responsibility, teamwork, interdependence and other interpersonal skills – important for careers and employability.

How does the jigsaw technique work?

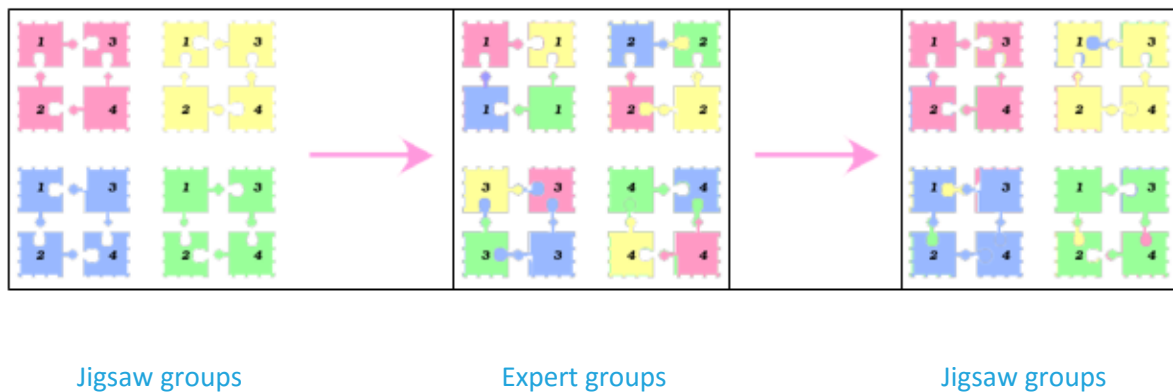
Before the lesson

The teacher:

- breaks down the subject matter into manageable chunks or pieces, e.g. the teacher divides a biographical account of George Clooney's career into four numbered paragraphs
- puts students into jigsaw groups and identifies group leaders, e.g. in the above example, each group will have four students in it so that each student can be given one of the four paragraphs about George Clooney. It is also useful to assign paragraphs to specific students in order to meet their needs and balance the groups
- trains students to be group leaders.

NB. The ideal size for jigsaw groups is 3-5 students but they can be bigger. When grouping students, think about having mixed groups (e.g. mix of abilities, assertive and less-assertive students, boys and girls) as this maximises the benefits of the technique. Ideally, every student should be given the

chance to be a group leader over time. An alternative to the teacher identifying group leaders is for students to choose their own leaders.



Phase One – Getting into jigsaw groups and breaking out into temporary expert groups

The teacher:

- introduces the lesson, makes appropriate links, clarifies the expected learning outcomes and reminds groups of what came out of their review of their previous performance
- establishes or re-confirms ground rules for cooperation, e.g. treat each other with respect, listen to each other, give positive feedback, do not waste other people’s time
- re-caps on the tasks and responsibilities of the student group leader if necessary.

Students:

- first get into their jigsaw groups and receive their paragraph of information
- then go into temporary expert groups with other students who have the same paragraph of information as themselves and help each other learn it thoroughly and think how they will teach it to the others in their jigsaw group when they go back.

NB. Allow 10-15 minutes for students in their expert groups. The aim is to make sure that students really understand the subject matter. (It should not be permitted for them to go back into their jigsaw groups and read what is on the card or give it out to other students to read for themselves). Students in the expert group should help each other comprehend the material, e.g. one student could read the paragraph out loud to help students with reading difficulties. The expert group should also discuss the best way of presenting the material to the members of their jigsaw group. Encourage students to make notes and jot down keywords for their presentations but discourage them from writing down word for word what they are going to say, i.e. to use a good revision and memorisation technique. Keep the composition of the jigsaw groups broadly the same for the duration of a unit or module, but change the membership of the expert groups by changing the allocation of paragraphs of information.

Phase Two – jigsaw groups

Students:

- teach each other what is in their numbered paragraphs of information starting with the first one
- check with each other that they have understood the subject matter, e.g. by asking each other questions
- spend a few minutes at the end reviewing how well their group performed.

NB. Allow 20-40 minutes for students in their jigsaw groups. Students should not be allowed to shortcut the process by reading each other's paragraphs. If a group is having a problem, try and support the student leader of the group in overcoming it rather than to intervene directly or take over yourself.

Phase Three – a test of understanding

Teachers:

- remind students of the expected learning outcomes
- choose a way of checking that each student has understood the whole of the subject matter, e.g. by listening to a group presentation, asking questions, holding a discussion.

What are the benefits?

- Enables the teacher to focus on other teaching priorities (e.g. giving focused support) besides transmitting knowledge from the front of the class
- Lower achieving students are able to use higher achieving students as a resource to help them master the subject matter.

What can't you use the jigsaw technique for?

- Requires a degree of literacy and conceptual ability so not suitable for very young children
- Less suitable for the development of new skills but works best when students use the jigsaw technique to practise their skills
- Not suitable for subject matter that must be learnt in a particular sequence.

Essential tips

- Try to match the challenge of the material in the paragraph to the abilities of the group. You can step this up as students become more experienced in learning in this way
- Collaboration tends to develop spontaneously but preliminary activities to promote cooperation are useful, e.g. the broken squares game. Using the technique for the duration of a course or module (e.g. over 6-10 weeks) helps students to cooperate more effectively
- Do not make competition between individuals or groups part of the jigsaw technique as this will inhibit the learning process (Individuals will not help each other in their expert groups if the jigsaw groups are going to be in competition with each other). If jigsaw groups become too competitive, consider restructuring them

- Expert and jigsaw groups can meet outside of class to prepare and practise
- If you need to juggle the size of the groups or the number of paragraphs to be taught, you can simply give one student two paragraphs to teach or ask two students to work as a pair and teach their paragraph to their jigsaw group
- You can use the technique to train colleagues as well!

Further information

- Aronson, E. & Patnoe, S. (2011) *Cooperation in the Classroom: The Jigsaw Method* (London: Pinter and Martin). Provides research evidence for the effectiveness of the technique.
- The Jigsaw classroom <https://www.jigsaw.org/>
- Jigsaw FAQs <https://serc.carleton.edu/introgeo/jigsaws/faqs.html>

Practical applications in careers work

- ***A job study***

The teacher finds a source of job information and divides it up into sections, e.g.:

Dentist (Four sections)

- Description of the work
- Entry, qualifications and training
- Personal qualities and skills
- Labour market information including salaries

- ***A sectoral investigation***

The teacher finds a source of information about a sector of industry and divides it up into sections, e.g.:

Engineering – (Five sections: the four main branches of engineering and specialisms that combine different branches of engineering for a specific purpose)

- Mechanical engineering
- Chemical engineering
- Civil engineering
- Electrical engineering
- Specialisms, e.g. aerospace, bio-medical, building services, environmental, marine, materials.
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- ***Careers using subjects***

The history teacher uses the jigsaw technique to help pupils learn about the career prospects of poor children in Victorian England.

1. Scholars

The 1880 Education Act made school attendance compulsory between the ages of five and ten. It was introduced by the government so that children could be taught basic skills (i.e. literacy and numeracy) and the discipline they would need to get and keep a job.

Before then, children's experience of schooling was mixed. Only well-off families could afford tutors for their children or send their sons to boarding schools. Some middle class children went to grammar schools or private academies. Local churches and charities often arranged a small amount of education for children of the poor. The standards in some schools was not very high. Dame schools usually run by elderly, poorly-educated women had a bad reputation. Poor children often attended school irregularly. Their families needed them to earn money whenever they could rather than go to school.

For poor children, becoming a pupil-teacher was one way of building a career for themselves. Thirteen-year-olds who showed an aptitude for teaching could become apprenticed to a headteacher for five years. Boys were paid £10 pa during the first year and girls received about two-thirds of this). Pupil-teachers could then go on to sit the examination for a place at a teacher training college.

Then as now, getting a good education is one of the keys to improving an individual's career prospects, but for poor children earning usually took priority over learning.

2. Boys' jobs

Boys had more employment opportunities than girls. What those opportunities were varied depending on where you lived.

Children in the countryside could sometimes get farm work especially at harvest time but the pay was poor and because of mechanisation the number of jobs available was declining. The part-time jobs that children had on farms were not really preparation for adult careers in farming.

In 1860 the age limit for boy-miners was raised to 12, and in 1900 to 13. They worked very long hours. Some boys pushed trucks of coal along mine tunnels, others opened and shut wooden doors to let air through the tunnels. Children working on the surface sorted coal.

Pay was better in the towns and cities which were expanding rapidly. Shop work was increasing and boys could work as errand boys making deliveries. They might also find a job in an office as a messenger. These were a first step on the employment ladder but did not necessarily lead to a career. Boys could also get jobs in domestic service (working in a private household) as indoor servants, gardeners and pot boys (washing up).

Shoe blacks were children who cleaned boots and shoes for a living.

Families had to be desperate to hand their boys over to a chimney sweep to become climbing boys. Cleaning chimneys was almost the opposite of having a career because of the risk of permanent injury or death.

Some so-called jobs offered no career prospects at all and were little more than a disguised form of begging. Crossing sweepers, for example, cleared the way for people to cross the road without dirtying their clothes on horse dung, dirt and mud.

3. Girls' jobs

The 1851 census showed that 20 per cent of girls between the ages of 10 and 14 were in employment. The corresponding figure for boys was 38 per cent. Girls who were not employed or at school may have worked in the family business or done work in the home such as cleaning, washing, sewing and child care.

The most important source of employment was domestic service. In the 1850s one in nine girls over the age of 10 worked as servant girls for well-off families. Many lived a long way away from their own families and, as one week's holiday a year was not allowed until the 1890s, they could feel quite lonely. Servants were expected to be quiet and not speak unless spoken to. Their lives were hard and wages were very low but they were provided with food, clothes and somewhere to sleep.

Some girls were employed as milliners (hat makers) and dressmakers. Their apprenticeships lasted two years after which they still had to do more training. Many lived in the homes of their employers. They worked long hours and often the food, lighting and ventilation were not good. Day-workers who lived in their own homes were paid less and the work was less regular.

Some girls did casual and unskilled work such as selling flowers, matches and ribbons.

4. Crime

Not all child thieves were career criminals. Poverty drove them to steal food and valuables which they sold in pawn shops and public houses to get money for themselves and their families. However, juvenile crime was a serious problem. The stealing of silk handkerchiefs was popular because they could be sold easily. The vast majority of pickpockets were teenagers and younger boys. Criminal gangs of young boys and girls trained by a criminal boss existed in London and elsewhere. Charles Dickens drew attention to the problem in *Oliver Twist*.

The punishments given out to young offenders were very harsh. Child criminals could be whipped or flogged. They could also be put in prison alongside adults. Some were sentenced to death but after 1831 no executions of children under the age of 14 were carried out. Until 1857, children as young as 10 could be transported to Australia for seven or 14 years to work on public building projects or as a servant to a private employer.

After 1854, reformatory schools were set up for offenders under 16 years old to complete some or all of their sentences. They were harsh places where children were made to do practical tasks.

5. Poverty

Poor children often worked with their parents in the home or in a workshop, e.g. sewing, making matchboxes, Children worked to keep their families from becoming destitute (hungry and homeless). They took pride in bringing money home to mother. In the slums in towns and cities, overcrowding, disease and early death were commonplace. Parents could also die at a young age and not be able to help their children get an education or find work.

Often inspired by their faith, social reformers tried to help children living in poverty. Ragged Schools were founded in the 1840s to provide free education for the very poorest of children. The London Shoe Black Brigade was established in 1851 to give children regular employment cleaning shoes. In 1870, Dr Thomas Barnardo opened his first orphanage.

If all else failed, children and their families entered the workhouse. The sexes were kept apart and children over the age of two were separated from their mothers. Conditions were unwelcoming – the food was dreary and the accommodation was basic. Inmates were expected to do unskilled work in return for their keep. Children were taught in the workhouse but standards were very low. However, where possible the workhouse authorities tried to find apprenticeships for the children.