CHILDREN CHALLENGING INDUSTRY (CCI):

A programme that increases young people’s engagement with science and their aspirations to become the scientists and engineers of tomorrow.

Since the Children Challenging Industry (CCI) programme began in 1996, it has placed school science in a real-life context across different national regions.

CCI includes practical problem-solving activities, resources and support for children and teachers, followed by site visits to local industry or occasionally an ambassador visit, plus professional development for teachers and industrial partners.

The activities were modified due to the Covid-19 pandemic, which necessitated the switch to a remote programme which incorporates new and innovative elements.

Since CCI began in 1996

<table>
<thead>
<tr>
<th></th>
<th>1996</th>
<th>2020 – 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>schools</td>
<td>1,989</td>
<td>55</td>
</tr>
<tr>
<td>children</td>
<td>58,451</td>
<td>1,568</td>
</tr>
<tr>
<td>teachers</td>
<td>9,475</td>
<td>683</td>
</tr>
</tbody>
</table>
The positive impact of the CCI programme on primary teachers and children

“Changing aspirations, improved attitudes, greater awareness”

Before CCI

After CCI

Children’s changed aspirations

“I really enjoy participating in science experiments and recording results”

Boy, Year 6

“I could work in industry in the future”

27%

34%

“I would like to be an electrical engineer when I am older”

Boy, Year 6

“I liked doing the most recent experiment we did with glycerine and water I found it cool we were making cough syrup”

Girl, Year 6

“I have inspired me so that I could possibly become a scientist, engineer or chemist when I am older”

Girl, Year 6

“I liked learning about industry and doing the experiments”

Girl, Year 5

“I enjoyed learning about industry and doing the experiments”

Girl, Year 5

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Boy, Year 6

“I liked doing the most recent experiment we did with glycerine and water I found it cool we were making cough syrup”

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“It has inspired me so that I could possibly become a scientist, engineer or chemist when I am older”

Girl, Year 6

“I really enjoy participating in science experiments and recording results”

Boy, Year 6
Industry causes as little pollution as possible

14%

39%

More favourable attitudes to science and industry

Our lives would be worse without industry

54%

64%

Industry makes things we need

78%

83%

“I liked all of it because it was very fun to experiment and see the results and what we thought was going to happen and what really happened it made me curious which was really fun”

Girl, Year 6

Greater awareness of job roles

Many scientists work in industry

58%

78%

Young people work in industry

31%

46%

Many engineers work in industry

62%

74%

Scientists have important jobs in industry

72%

81%

“I really like science”

Girl, Year 6
Parents and Carers: Talking about science learning in school

The majority of children responded positively about their family views of having future roles in science and industry

<table>
<thead>
<tr>
<th>Family views about the relevance of having future roles in science and industry</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>My parents/carers think it is important to learn science</td>
<td>69%</td>
</tr>
<tr>
<td>My parents/carers think science is interesting</td>
<td>63%</td>
</tr>
<tr>
<td>My parents/carers will be happy if I become a scientist</td>
<td>57%</td>
</tr>
<tr>
<td>My parents/carers will be happy if I become an engineer</td>
<td>55%</td>
</tr>
</tbody>
</table>

“"I told my parents all the time what I do in science how much I liked it”

Girl, Year 6

“"My mam, dad and grandparents asked me some more questions about my lesson and they told me that they would love to do that when they were younger”

Boy, Year 6

The value of school-industry links – CCI ambassadors

CIEC’s advisory teachers delivered remote training for industry partners who would usually offer site visits^1.

They also delivered remote CPD and support to 683 primary teachers and activities for 1568 children from 55 schools.

“I enjoy speaking to the scientists and learning about catalytic converter”

Boy, Year 6

“I enjoyed learning facts from three scientists, and we got to ask questions which I liked. I really like science”

Girl, Year 6

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^1 Partners: Air Products, Alpek Polyester, Croda, EDF, Fujifilm, ITS, Johnson Matthey, Micropore, National Horizons Centre, PX Limited, Sartorius Stedim, Tees Valley Combined Authority, Thomas Swan and Wood.
Word Clouds of Science and Industry

Children increased the science and industry vocabulary used in their responses to open questions about science, the CCI activities, interactions with CCI ambassadors, and what they told family members about the programme.

“I told them (family members) that there was people on the screen that told us about industry, and we did 3 experiments”
Girl, Year 6

“I liked been on a zoom call with scientists it very interesting and fun”
Girl, Year 6
Benefits of Professional Development for Teachers

Primary teachers rated the CCI classroom activities positively and their experiences during the programme,

<table>
<thead>
<tr>
<th>Teachers rated CCI classroom activities and their experiences</th>
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<tbody>
<tr>
<td>The classroom sessions offered an effective link with industry</td>
</tr>
<tr>
<td>I would now be confident to arrange visits to or from industry</td>
</tr>
<tr>
<td>My knowledge of industry has improved</td>
</tr>
<tr>
<td>I will use the written resources again</td>
</tr>
<tr>
<td>My confidence to teach science has improved</td>
</tr>
</tbody>
</table>

“Participation in the programme has also improved teachers’ own attitudes towards industry and their understanding of possible STEM careers within it.”

“I saw it being used successfully in my previous school and how it ensured a rich and broad exposure to science for the children.”

“The programme has helped me with my teaching, working alongside a professional in the area.”
Primary teachers rated the CCI programme and resources highly, stating that their confidence has improved, and that they feel more comfortable teaching STEM in everyday contexts.

100% of teachers have said that the CCI programme overall is **excellent** or **good**.

- Excellent: 73%
- Good: 27%
Teachers’ reflections on the CCI programme demonstrate that CCI has an impact beyond one class in each school, and the potential to be included in the curriculum for many more classes of children.

**Teachers’ reflections on the impact of the CCI programme in their schools**

<table>
<thead>
<tr>
<th>Reflection</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>My expectations of the programme were met</td>
<td>100%</td>
</tr>
<tr>
<td>I have managed to enthuse at least one colleague about CCI</td>
<td>90%</td>
</tr>
<tr>
<td>I intend to share my CCI experiences with colleagues before the end of the school year</td>
<td>83%</td>
</tr>
<tr>
<td>Other classes in my school benefit from CCI, in addition to my own</td>
<td>77%</td>
</tr>
</tbody>
</table>

**IN SUMMARY**

Data gathered before and after the programme showed that the CCI programme contributed significantly to the science and industry-related professional development of the teachers involved. More teachers reported feeling more comfortable teaching about STEM in everyday contexts. Moreover, children's attitudes towards science and industry become more positive; they become aware of the links between the processes that industries carry out and the science that they study in school. They are also more aware of science-based industry's potential as a future employer. Thus, participation in the CCI programme has provided a valuable new perspective for children's appreciation of the relationship between their school science and the world of work; while teachers have increased knowledge of and enthusiasm for school-industry links.

“Teachers’ reflections on the impact of the CCI programme in their schools”

To learn more or find out how you can become involved please:

Visit our website: [www.ciec.org.uk](http://www.ciec.org.uk)

Call us on 01904 322523

Email: ciec@york.ac.uk

Centre for Industry Education Collaboration

University of York, Heslington, York, YO10 5DD

“Teachers’ reflections on the impact of the CCI programme in their schools”